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Vol. XXV. No. 7.

J. Brackenridge Clemens,
Died 1867.

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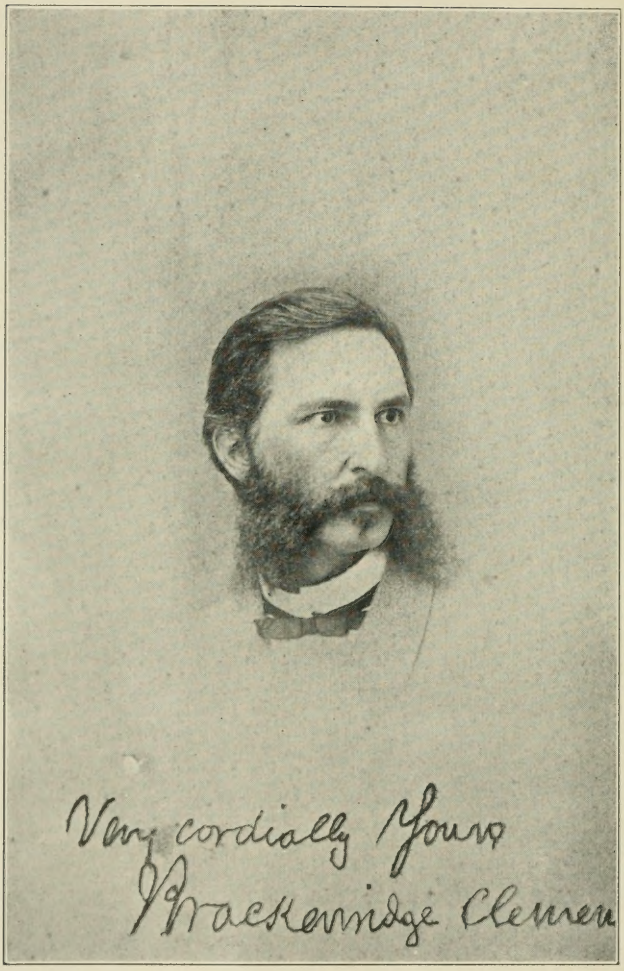
Very cordially Yours
J. Brackenridge Clemens

ENTOMOLOGICAL NEWS

AND

PROCEEDINGS OF THE ENTOMOLOGICAL SECTION

ACADEMY OF NATURAL SCIENCES, PHILADELPHIA.

VOL. XXV. JULY, 1914. No. 7.

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Dr. J. Brackenridge Clemens.

By HENRY SKINNER, M.D., Sc.D.

(Portrait, Plate XII.)

Doctor Clemens was born in Wheeling, Virginia (now West Virginia), in 1829 or 1830, son of James Walton Clemens, M.D., and Elinor Sherrard. His father attended lectures at the University of Pennsylvania in 1823-24.. The subject of our sketch attended the Virginia Military Institute for three years previous to entering the University of Pennsylvania at Philadelphia, where he was graduated from the Medical Department in the class of 1849, but he did not actively practice his profession. In 1850 he married Susan Burke Wagener, daughter of David D. Wagener, of Easton, Pennsylvania, who was a congressman from 1838 to 1841. Four children were the result of this marriage: Mary Wagener Clemens, Harold Clemens, James B. Clemens, M.D. (University Penna., 1883), and Maurice Clemens. *The Practical Entomologist,* a journal

published by the Entomological Society of Philadelphia, contains the following (Vol. 2, page 58, 1867):

Died of typhoid fever on January 11, 1867, Dr. Brackenridge Clemens, of Easton, Pennsylvania. It was only the middle of December when he was at the hall of the Entomological Society of Philadelphia, looking as hale and hearty as ever. He was an excellent entomologist, with good, sound, general views, and had devoted his especial attention to the Lepidoptera (moths) of this country. Readers of *The Practical Entomologist* will recall his name as having been more than once quoted as authority in Answers to Correspondents.

April 11, 1859, he was elected a Corresponding Member of the Entomological Society of Philadelphia. When he died the Society adopted suitable resolutions expressive of its appreciation of his intellectual attainments and of the high literary and scientific character of his work, and that the Society "has lost one whose ability was great, and the acuteness of whose mind was large, capable of searching to the greatest depths, and bringing therefrom the long sought knowledge." He was buried at Easton, Pennsylvania.

The distinguished English entomologist, the late H. T. Stainton, F. R. S., Secretary of the Linnaean Society of London, was so impressed by the value of Clemens' writings on the Microlepidoptera that he republished them in book form. The title of this work is "The Tineina of North America, by (the late) Dr. Brackenridge Clemens (being a collected edition of his writings on that group of insects. London: John Van Voorst, Paternoster Row. 1872." Stainton says:

"Little did I think when I received his first letter in 1857, two years before he became an author, that his career was to be so brilliant and so short. I had for some years contemplated putting together such an arrangement of his writings as would enable those who were previously unacquainted with them to profit by his remarks on the habits of new genera, genera with which we in Europe were unacquainted."

In the years 1857 to 1860, Stainton received nine letters from Dr. Clemens and published them in the above mentioned work. They are very interesting and show Clemens to have been a man of unusual culture, education and refinement, and a keen naturalist. He was first attracted to the subject of natural history from the aesthetic standpoint, for he says:

"I have devoted my attention almost exclusively to Lepidoptera—why, I do not know, unless I was first attracted by their beautiful colorings."* "The field of observation here is almost unlimited, poorly cultivated and abounding in the most interesting, beautiful and undescribed rarities." In his first letter he says: "Should I not, even at the risk of being egotistical, give you some introduction to myself? I am yet young, as you have perhaps conjectured, a physician by education and profession, and a graduate of the University of Pennsylvania; but here, I fear, my scientific qualifications to your regard must find an end. I stand merely on the shores of science, gazing on the immensity before me. And as I follow with my eyes the full-freighted intellects which, fanned by the wings of fame, sail over its placid waters in search of unknown truths, I am filled with doubts and the feelings of despair which arise from a consciousness of my own imperfections." Letter No. 4 says, in part: "I determined long since to form no collection for myself and freely gave away all specimens I have systematized. Such specimens as are new I add to the collection of the Academy of Natural Sciences of Philadelphia, where anyone may find them." No. 6: "It is with feelings of some trepidation that I send by present post my first paper on Entomology. Need I say I shall be pleased to have your opinion on it? Do not hesitate to indicate that which you conceive to be objectionable or erroneous. I have honestly expressed the results of my own labors, regardless of the praise or disapprobation they may meet with, and confident that if my conceptions are truthful and accurate they will stand the tests of examination and discussion."

Letter No. 9 (the last) was dated Easton, Pennsylvania, October 29, 1860, mentions the deaths of a lovely and accomplished sister and his father-in-law, whom he greatly respected and loved. These letters show him to have been generous, loving, modest, fearless, and of poetic feeling. He was evidently inspired with the love of science and nature. It was a great pity that such an ardent and capable worker should have been the victim of what is now called "the crime of typhoid fever."

In 1903, August Busck, an authority on Tineina, wrote as follows:

* When Dr. Clemens was attracted to the micro-moths on account of their beauty he probably never imagined that they would become of economic importance. A number of his species attack crops and are very destructive. This is due to the fact that man has upset the balance of nature. *Crambus caliginosellus* Clem. is estimated to do $800,000 damage to tobacco in Virginia annually, and other species he described in this genus injure grasses, oats, corn, wheat and rye.

"Although a few stray species of American Tineina were described before 1859, that year really marks the beginning of the study of these insects in this country. During that and the following four years Dr. Brackenridge Clemens, of Easton, Pa., published a series of systematic and biological articles which yet remain the most important contribution to our knowledge of American Tineina. These papers contain descriptions of thirty-one genera and about two hundred new species, together with notes on larval habits of many of them."

The Clemens types were presented to the American Entomological Society by his widow in 1867. They were contained in boxes bound as books, in leather, and were labeled "Etudes Entomologiques, Clemens, Vol. I," etc. The specimens were pinned on small corks, gummed to glass, and each cork had a printed number, these numbers corresponding with the names and numbers of a list. Studies of the collection made by Busck resulted in the identification of the types of all but eight of Clemens' two hundred species. Five of these eight have been identified with certainty from Clemens' descriptions, leaving only three species unknown at that time (1903).

Stainton gives a list of seven papers published by Clemens in the Proceedings of the Academy of Natural Sciences of Philadelphia and ten in the Proceedings of the Entomological Society of Philadelphia. He published an important paper in the Journal of the Academy, iv (2), 97, 1859, entitled "Synopsis of the North American Sphingidae." This shows great ability and research and was the foundation for subsequent revisions of the American species. Much was thus accomplished in a few years by this pioneer American Lepidopterist, whose brilliant career was ended in such a sad and unfortunate way.

The non-entomological facts stated in this paper were supplied by Dr. James B. Clemens, of New York City, a son of Dr. Brackenridge Clemens, and by Dr. Ewing Jordan, of the University of Pennsylvania.

Changes of Address.

Kindly change my address from University of California, Berkeley, to Citrus Experiment Station, Riverside, California.—H. J. QUAYLE.

Please address me at 644 Sixth St., N. E., Washington, D. C., instead of 703 East Capitol St.—HERBERT S. BARBER.

A New Species of True Katydid from Western Texas (Orthoptera; Tettigoniidae).

By James A. G. Rehn and Morgan Hebard.

Pterophylla excelsa new species.

General appearance and form similar to *P. camellifolia* (*Cyrtophyllus perspicillatus* of authors); general form of pronotum similar to that species but resembling that of *Paracyrtophyllus robustus* in the caudal margin of the disk, which is subtruncate, and in the length of the same which is less than the greatest width; ventral margins of lateral lobes of pronotum differ from all other North American species in being moderately oblique, declivent cephalad. Subgenital plate of males distinctive in form and reaching beyond the tips of the tegmina, but apparently showing a development of the type found in *Paracyrtophyllus robustus.* Cerci of male distinctive but showing nearest affinity to *Lea floridensis.*

Type.—Male; Moss Well, foot of Pulliam Bluff, Chisos Mountains, Texas. September 5-8, 1912. Elevation 4700-5000 feet. (Rehn and Hebard.) [Hebard Collection.]

Size and general form similar to *camellifolia.* Head larger and broader than in that species, with fastigium of the vertex more decidedly produced in a spine which projects distinctly beyond the plane of the face; face much flattened, with lateral margins distinctly defined in weak ridges, these ridges subobsolete dorsad; labrum distinctly broader than in *camellifolia.* Pronotum similar to *camellifolia* in contour, transverse sulci and lateral canthi, but with length of disk less than greatest (caudal) width and with caudal margin subtrun-

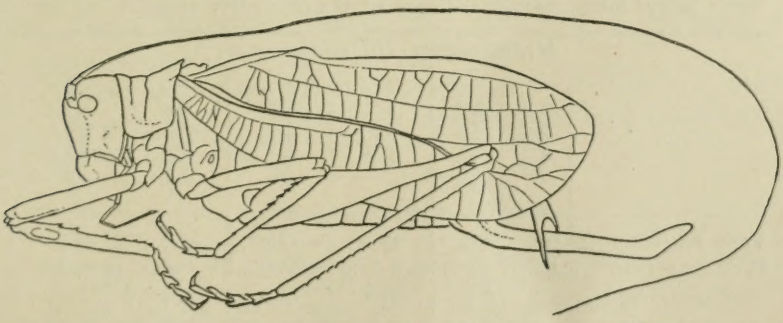
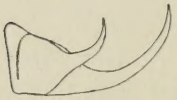
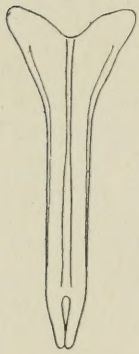


Fig. 1.—*Pterophylla excelsa* n. sp.—Lateral outline of type. (x 2.)

cate; lateral lobes with ventral margin moderately oblique, declivent cephalad with ventro-cephalic angle more broadly rounded than ventro-caudal angle, which is distinctly more ample, weakly obtuse-angulate. Tegmina much less ample than in *camellifolia*, with veinlets more regular and pronounced, stridulating area much as in that species. Wings almost as long as tegmina, by which they are wholly concealed. Limbs and armament of same as in *camellifolia*. Supra-anal plate somewhat longer than broad, sulcate meso-proximad, beyond this portion moderately expanding, with distal margin subtruncate and moderately serrate. Cerci evenly rounded at base, then forking at a distance equal to the basal width and produced in two very slender and little divergent spines which have an even inward curvature, the outer spine nearly twice as long as the inner (dorsal) spine. Subgenital plate nearly as long as the caudal femur; the heavy margins of the produced shaft forming a broad, deep mesal groove both dorsad and ventrad; apical portion split, with the two parts distinct but attingent distad, this portion directed dorsad at a very broad obtuse angle to the produced and horizontal shaft.





Pterophylla excelsa n. sp.
Fig. 2.—Cercus of male. (x 5.)
Fig. 3.—Ventral outline of subgenital plate of type. (x 2½.)

Allotype.—Female; Chisos Mountains, Texas. July, 1911. (H. A. Wenzel.) [Academy of Natural Sciences of Philadelphia.]

Similar to the type, but larger. Supra-anal plate longer than broad, distal margin rotundato-truncate. Cerci long, nearly straight, terminating in a sharp tooth. Ovipositor similar to that of *camellifolia*. Subgenital plate nearly divided mesad into two very narrow and transverse lateral lobes, leaving the base of the ovipositor exposed.

Measurements (in millimeters).

	Length of pronotum	Caudal width of pronotum	Length of tegmen	Greatest width of tegmen	Length of caudal femur	Length of Subgenital plate
Type, *male*	5.	5.9	27.2	11.7	18.9	16 9
Paratypes, *males*...	4.7–6	5.6–7	24.8–31.9	10.8–13.1	17.8–22.6	16.7–18.9
Allotype, *female* ...	5.3	6.7	36.4	13.1	23.7	.....

The ovipositor of the allotype is 16.8 mm. long and 3.1 mm. in greatest width.

The tegminal measurements are given for these organs in their convex natural condition; were the tegmina flattened out a decided increase in length and width would result. The type is about the average for the series of males taken by the authors; the male taken earlier in the season with the allotype is very large.

In life the specimens were jade green; this color has become pale on the body and limbs in the majority of dried specimens. The eyes are walnut brown.

The present species is known only from the Chisos Mountains, situated in the southern portion of the Great Bend region of the Rio Grande in western Texas. The following field notes were taken: "This species is everywhere on the hillsides above 4700 feet elevation in low oaks (15 to 25 feet in height) and at dusk the males begin their incessant song which is continued through the night. This song consists of a single rasping note, quuck—quuck—quuck, repeated incessantly and very deliberately. One was startled into giving this note in the early afternoon of a cloudless day when a rifle was fired over the cañon. The specimens are found in the trees usually near the lower branches, perched upon the twigs among the leaves; they are very hard to locate, but when the collector has climbed into the tree an individual will usually recommence its song if he keeps still under it for a few minutes. When closely approached they invariably leap clumsily into space, unless quickly seized, and upon hitting the ground at once begin to crawl away. When seized they often utter their note in an irritated manner."

Specimens examined.—25; 24 males and 1 female.

Chisos Mountains, Texas, July, 1911 (H. A. Wenzel), 1 male, 1 female, *paratype, allotype,* [A. N. S. P.].

Moss Well, Chisos Mountains, Texas, September 5-8, 1912, (R. and H.), 23 males, TYPE, *paratypes,* [Hebard Collection and A. N. S. P.].

Diptera at High Altitudes.

Prof. T. D. A. Cockerell, in the *Entomologist* for April, 1914, notes that he collected, August 28, 1913, *Stomoxys calcitrans, Phormia terrae-novae, Musca domestica* and *Allograpta obliqua* at timber line, 11,200 to 11,300 feet altitude, on the Long's Peak trail, Colorado.

Standards of the Number of Eggs laid by Insects (Orthop.)—XI.*

Being Averages Obtained by Actual Count of the Combined Eggs from Twenty (20) Depositions or Masses.

By A. A. GIRAULT, Nelson, Cairns, Queensland.

15. *Periplaneta australasiae* (Fabricius)

No.	Date, 1913	No. counted per mass	Successive Totals	Av. per Egg Mass	Max.	Min.	Range	
1	May 10	26	26	26.				
2		26	52	26.				
3		28	80	26.6	28			
4		26	106	26.5				
5	May 12	28	134	26.8				
6		26	160	26.6				
7		28	188	26.8				
8		24	212	26 5				
9		26	238	26.4				
10		27	265	26.5				
11		28	293	26.6				
12		27	320	26.6				
13		26	346	26.6				
14		28	374	26.7				
15		22	396	26.4		22		
16		28	424	26.5				
17		26	450	26.4				
18		24	474	26.3				
19		26	500	26.3			28	
20		24	524	26.2			22	
20			524	26.	28	22	6	Finals

The eggmasses were collected in a private residence at Nelson (Cairns), Queensland, Australia, where the only available food consisted of starch and glue in book bindings, straw used for packing materials, wrapping paper and the like. The residence was used as a laboratory and no food for human consumption was kept about the place nor prepared therein. Another, jet black egg case, longitudinally striate and of an unknown species, rarely found in the same place, averaged about 34 eggs each.

* For the first ten of this series, see Ent. News, 1901, p. 305; 1904, pp. 2-3; 1905, p. 167; 1906, p. 6; 1907, p. 89; 1908, pp. 4. 383; 1909, pp. 355-357; 1911, pp. 14-15 and 1912, pp. 355-356.

A new Dilar species from Japan (Neur. Plan.).

By Waro Nakahara, Tokyo, Japan.

The genus *Dilar* was not known in Eastern Asia until Navás described a species, *D. septentrionalis* (Rev. Russ. d'Entom., xii, pp. 420-21, 1912), from Siberia, although eleven species of the genus were recognized from various parts of the world before that time.

The new species which is described in the present paper is, therefore, the second species of the genus in the region just referred to.

Dilar nohirae n. sp.

Head ochraceous yellow; ocelli yellow, anterior one marked with piceous; frons and clypeus spotted with fuscous black; palpi fulvous. Antennae of the male fulvous with about 25 joints, a few basal joints are more or less suffused with fuscous, joints in the middle of the antennae are much more elongated than those near the base or near the apex; lateral appendages of nearly equal length present on third to eighteenth joints.

Prothorax wider than long, yellowish, with a transverse impression in middle; three tubercules, of which the median is somewhat smaller than the other two, present before the impression; small tubercules exist on both sides and behind the median impression.

Abdomen fuscous on both ventral and dorsal surfaces; covered with yellowish hairs, especially near apex; lateral surfaces pale. Lateral valve of the male genitalia is shiny yellow and clothed with hairs.

Legs ochraceous yellow, very hairy; extremity of femur of each leg is blackish.

Wings hyaline, slightly colored with yellowish; with numerous small fuscous spots on fore wing and costal area of hind wing; the spots are larger and more deeply colored towards base in the fore wing; the largest fuscous spots with a small whitish centre in middle of the space between the first radial sector and the first branch of the second sector; spots around the largest one are slightly colored. Neuration pale yellow; costal cross veins mostly simple, but some in middle are furcate; about six cross veins between subcosta and radius, about ten between radius and its second sector; radius with two sectors, the second of which has four branches; two series of gradate veinlets very irregular and imperfect; some cross veins present besides those of the gradate series.

Length of body, 10 mm.; of fore wing, 14 mm.; of hind wing, 12 mm.; of antenna, 5.5 mm.; width of fore wing, 6.5 mm.

A single male specimen captured by Mr. Akio Nohira at Yoshino, Province Yamato, is in my collection. There are also a few specimens obtained along with that just mentioned in Mr. Nohira's collection.

This species is quite distinct from all other known species in the number and arrangement of tubercules of prothorax, and of course in many other respects.

Since there has been hitherto a single species of Dilaridae recorded from Japan by McLachlan, the discovery of the present species adds one more to our fauna. The Japanese species of the family, therefore, are as follows:

1. *Dilar nohirae* n. sp.....(Yoshino, Yamato)
2. *Rexavius japonicus* (McLachlan).....("Tukushima")

Dilar japonicus McL., Ent. Month. Mag., xix, p. 220 (1883); *Rexavius japonicus* Navás, Mem. de la Real. Acad. de Cienc. y Art. de Barcelona, vii, pp. 665-666 (1909).

A New Sugar Cane Aphis (Hemip., Homop.).

By H. F. Wilson, Entomologist, Oregon Agricultural College, Corvallis, Oregon.

(Plate XIII.)

Aphis bituberculata n. sp.

Specimens of this aphis collected on *Saccharum officinarum* at Audubon Park, New Orleans, Louisiana, were sent to me several times during the season of 1912. I have compared these specimens with descriptions, etc., of the other aphids found on sugar cane without being able to refer this species to any of them. I am therefore describing it as new.

Alate viviparous female.—General color dark green, antennae, legs and nectaries dusky to black. Antennal tubercles present but not elongate; antennae about two-thirds the length of the body, not quite reaching to the base of the nectaries, and with six segments.

The two basal segments are normal, while the third appears thicker and longer than the fourth, or the fifth and sixth together, not including the spur of the sixth; the fourth is slightly longer than the fifth, and the spur of the sixth is nearly as long as the third, fourth and fifth together. The third segment bears six to ten irregular-sized sensoria, all situated on the inner side, the fourth sometimes with a

APHIS BITUBERCULATA N. SP.—WILSON.

single sensorium on the inner side of the segment, about midway from the ends. The fifth with one sensorium near the tip, sixth with usual sensoria at the base of the spur.

Head with distinct frontal tubercle, prothorax long and with two dentate tubercles on each side instead of one, the usual number. Wings hyaline, hind wing with but a single oblique vein. Abdomen stout and with a row of three black spots on each side in front of the nectaries. Nectaries about three times as long as the cauda and tapering. Cauda short and held with the tip extended toward the head (see Pl. xiii, fig. *a*).

Measurements: Length of body, 1.81 mm.; width at widest part of abdomen, .76 mm.; length of antennae by segments, I, .07 mm.; II, .06 mm.; III, .24 mm.; IV, .19 mm.; V, .15 mm.; VI, .10 mm.; spur, .5 mm.; total length of antennae, 1.31 mm. Length of wing, 1.9 mm. Nectaries, .24 mm.; cauda, .085 mm.

Apterous viviparous female.—General color yellowish to dark green. Abdomen robust and with the anal plate broad and conspicuous. Antennae with six segments and not reaching to the base of the nectaries. Segments one, two, distal part of fifth, sixth and spur dusky to black, other portions opaque. Legs, except femora, dusky to black and the latter dusky at the distal ends. Nectaries black in color and tapering. Cauda short and turned back over the abdomen as in the case of the alate forms.

Measurements: Length of body, 1.76 mm.; width, .9 mm.; length of antennae by segments, I, .065 mm.; II, .06 mm.; III, .22 mm.; IV, .17 mm.; V, .15 mm.; VI, .09 mm.; spur, .5 mm.; length of nectaries, .24 mm.; cauda, .08 mm.

Explanation of Plate XIII.

Aphis bituberculeta n. sp. Above, alate viviparous female, *a* cauda enlarged, *b* antenna.

Below, apterous female.

Monograph of the Chrysophanids (Lepid.).

My appeal for help from American entomologists has been almost fruitless, only one observer having come to my aid. I want very specially *Heodes fieldeni, Chalceria snowi, cupreus, rubidus; Satyrium fuliginosa.* I should like also some specimens of *Gaeides xanthoides, editha* and *gorgon.* May I again appeal to brother entomologists on your side of the water for help. Palaearctics, exotics or cash given in exchange.—G. T. Bethune-Baker, 19 Clarendon Road, Edgbaston, England.

Butterfly Collecting in Mojave County, Arizona (Lep.).

By J. R. Haskin, Los Angeles, California.

A glance at the map of the United States will show the southeastern point of Nevada on the thirty-fifth parallel to be separated from Arizona by the Colorado River. About 35 miles east of the river on the line of the Santa Fe Railway is the small town of Kingman.

From the car window the traveler through this country sees only arid stretches of hill and plain—no trees and but a scanty growth of low brush, interspersed with cactus, to serve as a cover to the desert plains. Yet there is a wonderfully attractive something about this land that appeals to men and makes them return again and again. Those who have settled in it seem never satisfied when away for any length of time. Perhaps it is the dry, clear atmosphere and the brilliant sunshine; perhaps the feeling of being out in the limitless open, where each man's individuality stands out and he feels that he really is a man among men and not simply a unit in a group of other similar units.

To nature lovers, to naturalists, what appeals most strongly is the feeling of great open spaces, alive and yet so still, especially when the lengthening shadows subdue the hum of insect life and the occasional call of a belated bird sounds startlingly clear.

In the early spring of certain years, after the light snows have disappeared, western Arizona is like a beautiful garden. The ground is carpeted for miles with bright flowers of innumerable species. The clumps of low brush are fresh and green, and even the various species of cactus seem to have taken a new lease on life. Soon, however, the dry heat of approaching summer causes a rapid change and the country becomes an apparently barren desert except for the few scrubby bushes. About the middle of summer, rains may be expected and heavy downpours occur occasionally as late as September. Yet they have very little effect, as the water runs off so rapidly that the vegetation does not seem to benefit by it.

From my experience during the past four years I have come

to the conclusion that the best season for collecting in this country is in the fall of the year just after the fall-blooming shrubs have begun to blossom. Late in September and through October there is a season of fall flowers. This season varies slightly from year to year and, as it is rather short, one must be on hand at just the right time in order to get the best results. There is one shrub in particular, *Bigelovia graveolens* Gray,* which has proven a sure guide to successful collecting. It occurs in many places in the sandy washes along the foothills, and when its bulk of fine evergreen foliage becomes hidden by dense masses of small, bright yellow, strong smelling flowers, one is sure of making a good catch. The rank smell of this flower seems to have a wonderful attraction for butterflies and other insects and in certain spots one can find *halesus*, *strigosa*, *bachmanni*, and many others, so busily engaged that one can approach without caution and net them at will.

Most of my Arizona collecting has been done in and around the Goldroad district. Goldroad is a mining camp between Kingman and the Colorado River on the west slope of the Black Mountains, or River Range. The road from Kingman crosses the Sacramento Valley and up through a pass over the range, then down a steep winding road into Goldroad. Little Meadows, a water station halfway up the pass, and Silver Spring, below Goldroad, are good collecting grounds in the proper season, as there is rather more vegetation than usual in these spots.

Following is a list of specimens taken during the past few seasons. Probably a more exhaustive search than I have been able to make would result in some further interesting captures.

A. strigosa, *E. claudia*, *M. neumoegeni*, *P. gratensis*, *Synchloe californica* Wright, *P. cardui*, *L. bachmanni*, *L. mormo*, *L. palmeri*, *C. australis*, *T. halesus*, *T. melinus*, *T. leda*, *L. acmon*, *L. isola*, *L. myrina*, *L. exilis*, *P. protodice*, *N. iole*, *E. reakirti*, *C. eubule*, *M. caesonia*, *C. eurytheme*, *T. nicippe*, *P. asterias*, *P. ereectorum*, *P. tessellata*, and three Hesperids not identified.

* Identified by Dr. Anstruther Davidson, Los Angeles, Cal.

Melitaea neumoegeni Skinner, 1895.

About four years ago I caught what I thought was a new species, named it *M. marialta*, and sent photographs and a description to the NEWS. Dr. Skinner, however, wrote me that he had named it *neumoegeni* and that the description could be found in the NEWS, Volume 6, page 113, April, 1895. The types were taken, I believe, by the late Mr. Neumoegen in Utah and from the description I judge they are all males.

Dr. Skinner's description tallies closely with about forty male specimens which I have taken in the past four years. These males are of such a uniform, fulvous color on upper side, and the black markings are so light that their general appearance is much like a small *Argynnis*. No other *Melitaea* approaches it in uniformity of coloration. The fulvous darkens only slightly at the base of the secondaries and not at all on the primaries. The under side, especially of the secondaries, shows it to belong to the *gabbi* group.

In 1911, near Goldroad, Arizona, I was fortunate enough to see four females and to capture two of them. In appearance and habits they differ so widely from the males that, had I not seen one pair trying to mate and another actually in copulation, I would have been very uncertain as to their identity, even though I have never seen any other species of *Melitaea* in this vicinity during four years of collecting.

Of the two female specimens which I have, one was taken near Goldroad, Arizona, on March 30, 1911. In size and markings it is almost exactly like the illustration of the male, *M. augusta*, shown in Plate 14, No. 169, of Wright's *Butterflies of the West Coast*. The only observable difference is in the black bar dotted with a row of round spots across the ends of primaries. This is exactly as in the next figure, No. 169B. On the other specimen, taken at Little Meadows, near Goldroad, on October 4, 1911, the primary is almost the same as the above, but the secondary is almost solidly red and black with hardly a trace of the pale, buff spots. The under sides of both specimens are alike and similar to the males, except that

the males are silvered as in the rest of the *gabbi* group, while the females are not.*

In March, 1911, the male *neumoegeni* were abundant along the sandy roads and dry water courses in the small arroyos, or gullies, below Goldroad. They were flitting continually up and down these sandy stretches with a quick, jerky flight, resting frequently on the ground and occasionally on low twigs and dry weed stems.

The females, three of them, were seen further up on the hillsides in the brush at some little distance from the playgrounds of the males. These three which I saw near the end of March were apparently just out of their chrysalids, as they were very bright and fresh. Most of the males were badly worn and must have emerged a week or two earlier on the average than the females. One female which I caught was only a few hours on the wing. Another was in copulation and a third was flirting with a male. I was so anxious to obtain them that I got excited and missed both easy tries and the brush prevented further pursuit.

I believe this species is double-brooded, as I caught my first specimens in October, 1909, others in March, 1910, and others in March and October, 1911.

Concerning their distribution, I caught eight in March, 1910, near Cinco, California, east of Mojave, California, in the foothills along the Mojave desert. They are abundant in the Goldroad district, Mohave County, Arizona. Mr. Neumoegen's specimens came from Utah. It will probably develop that they are to be found in various sections of the arid country between these points.

Synchloe californica Wright.

I believe nothing has been published concerning this species except the original description in *The Butterflies of the West Coast,* by Mr. W. G. Wright.

*[Months after this paper was accepted for publication, the following additional note was received from the author.—Ed.]

In contrast to the two females taken at Goldroad are half a dozen taken in April, 1914, near Johannesburg, Kern County, California, on the Mojave Desert. These are all identical in color and markings with the males and average somewhat larger in size.—J. R. Haskin.

As Mr. Wright says, this species is different from the other Synchloes on account of its constancy of color. I took a series of Synchloes in June, 1911, at Georgetown, Texas, that had the same general area of buff and light brown as *californica*, but the details are somewhat different.

All of Mr. Wright's specimens, which I had the pleasure of examining at San Bernardino, were much worn and I believe for that reason even he did not realize how true to one form this species runs. I have found that as the individual becomes old and worn the lustrous black and buff become brown and yellow, giving the specimen a much lighter appearance than when fresh. With forty fresh specimens as uniform as one could obtain in as large a set of *Melitaea* or *Phyciodes*, I believe the following description will be of value as a supplement to that of Mr. Wright.

Expanse, males, 1.2 to 1.5 inches; females, 1.5 to 1.8 inches. Sexes alike on both sides.

Above, base and inner third of wings black, with three yellowish-brown spots arranged in a triangle on primary and one minute spot on secondary. A broad median band across both wings, pale buff on inner half shading abruptly to a light brown on outer half. Near costa of primary the buff shades to whitish. Outside of median band is a band of black with clear white dots between the nervules. Along the margins is a series of light brown crescents, constant on secondary, but with a tendency to disappear on primary of some specimens. The fringe is black, broken by white between the nervules.

Below, similar to above except at the bases. The base of primary is buff, then black to the median band, with a whitish spot at end of cell. The secondary is banded brown, black, white and then broadly black to the median band. The general effect on the basal area is a broad black band across both wings just inside the median band.

S. californica was taken about the scattered flowers along the base of the hills and along the roadsides. In general appearance and actions they are like some of the *Phyciodes* and I thought at first glance that my first specimens would prove to be of that genus.

My first specimens, six in number and all fresh, were taken September 15, 1909, at Little Meadows, near Goldroad, Arizona. I took twenty-seven the latter part of September, 1910,

some badly worn, near Goldroad and Little Meadows. Several more were taken at the same places in 1911 and 1912.

Further east in Arizona at Ash Fork, Jerome, in the Verde River valley below Jerome, and further south at Phoenix, I have not seen *californica* but have taken *S. crocale* in the Verde Valley and at Phoenix. Mr. Wright told me that he took all of his specimens in a canyon in Riverside County, California, on the east slope of the San Jacinto range, about opposite Palm Springs on the Southern Pacific Railroad. In May, 1913, I saw several just a little north of this on a mountain road west of Banning, which I am quite certain were *S. californica*, but could not obtain them as I had no net with me. I rather believe they are to be found in the foothills all along the Colorado River valley, and the valley running up through Imperial and Riverside Counties, which opens into the Colorado valley.

L. bachmanni.

This species is fairly common in the fall season about Goldroad, Arizona. In October, 1910, they were very numerous, especially in the stretch of valley below Goldroad, where *Bigelovia graveolens* was in full bloom. Riding horseback on a windy morning through this brush, I could see twenty or thirty at a time tailing out to leeward from every clump of *graveolens*. Catching them was not an easy matter. I would look forward to netting at least half a dozen specimens from one of these groups, but after one or two ineffectual passes with the net they would all disappear. Observing them carefully, I noticed that instead of flying away they would dart into the thicket and alight on the dead twigs with their wings folded and their antennae pointed forward in line with the perch on which they sat. Here they would remain motionless until my hand or the net approached within a few inches of them, when they would dart away and settle on another perch. The under side of the wings, when folded, has a perfect protective gray coloring which matches the gray of the twigs, and it was interesting to note the evident use these insects made of it.

Another interesting and rather remarkable feature about this swarm of *bachmanni* was the absence of the large projecting palpi on many of the specimens. In a set of forty good, fresh specimens I found thirteen—eight males and five females —without the projecting palpi which give it the curious appearance aptly described by its common name—the Snout Nosed Butterfly. In March, 1911, I caught one fresh specimen and found it to lack the palpi also.

L. mormo.

In the fall of the year *mormo* is found all over the hillsides of the River Range and can be taken by thousands if desired. In general their flight and habits are like those of the common *virgulti* of the west coast.

L. palmeri.

In October, 1911, I took four of this very small species in the bottom land below Goldroad. At first I took one to be a dwarfed *mormo,* but a second glance showed they were a different species. Probably a closer search would have discovered many more of them.

C. australis.

While not common, a special search for these in the vicinity of Little Meadows resulted in the capture of twenty-two perfect specimens in the fall of 1910. These were mostly taken while feeding on various small flowered plants, such as *Lepidospartum squamatum.*

T. halesus.

The most delightful two days of collecting I ever had were October 23-24, 1909, near the Little Meadows. I had been taking quite a few specimens of various sorts when for the first time I came across a great clump of *Bigelovia graveolens* in full bloom. All over its mass of yellow flowers I saw *strigosa, bachmanni* and other species flitting about and feeding, while here and there a black something, entirely different from the ordinary forms, gave me a real palpitation of the heart. After some debate as to what method to use, I tried a swift pass of the net crosswise and just above one of these new forms, and was rewarded by a violent fluttering in the small

end of the net. It was my first *halesus,* and by following precisely the same tactics I captured 46 specimens, almost all of them fresh and perfect.

The following year I went over the same ground, but did not see one. In 1911 I was unfortunately just a week or so too early for the flowering of *graveolens* and took only a few scattered *halesus*. I believe that a little later I would have found more of them.

The larva of *halesus* is supposed to feed on mistletoe. I noted a few clumps of it on some small oaks in the vicinity, but none of the butterflies themselves were in close proximity to these trees.

Holland and Wright fail to bring out one point with reference to the sexes, namely, that the males have one small tail, while the females have two—one small, the other long, flat and curled. The females are larger than the males and the metallic green luster is confined more to the base of the wings with more dead black on the outer areas. Denton's beautifully illustrated book on butterflies mentions this difference in the tail structure of the two sexes.

T. leda.

In October, 1911, I caught seven specimens at Silver Spring below Goldroad at about 1500 feet elevation. I caught frequent glimpses of these small, darting insects in the foliage of the mesquite trees, but it was impossible to net them on account of the annoying thorns common on this tree. Finally I found a clump of low flowering shrubs in a secluded corner and had no difficulty in netting a small series while they were feeding.

A careful comparison of these specimens with an extensive series of *T. ines* from Southern California, Southern Arizona and Northern Mexico, in the possession of Mr. Fordyce Grinnel, Jr., and myself, show them to be exactly the same. As Goldroad is only ninety miles west of Prescott, where the types of *leda* were taken, this confirms us in the belief that *leda* and *ines* are synonymous.

N. iole.

This is fairly common. Contrary to a description of the habits, which I read somewhere recently, stating that this species is found only in moist places, I found it only along the dry sandy spaces and on the hillsides about Goldroad and also on the dry plain about Ash Fork further east.

Except for notes on dates and captures, the other species mentioned in my list show nothing of particular interest. If one could spend an entire season in this interesting country, many more interesting features could doubtless be recorded and valuable studies worked out in detail.

Notes on North American Agromyzidae (Dipt.).

By J. R. Malloch, Urbana, Illinois.

Since the completion of my paper on the species of the genus *Agromyza** I have had the opportunity of examining the material in the collection of the Illinois State Laboratory of Natural History, and have also seen two species, kindly submitted by Dr. E. P. Felt, which make necessary the present supplementary paper on the group. I have indicated the changes necessary in the synoptic table to permit of the inclusion of the new species.

It may be of interest to mention that *Agromyza melampyga* Loew occurs in Britain. I captured a specimen of this species at Dunoon, Scotland, in July, 1912, while on a visit there. I cannot say whether the species has any European name or not, as the knowledge of this family in Europe is very unsatisfactory, and meanwhile leave our species as *melampyga*.

I have received several letters from correspondents requesting information as to what I have done with *Agromyza aeneiventris* Fallen in my paper. I take this opportunity of stating that I have not seen any American specimens which agree with the species considered by European authors as the true *aeneiventris*, so have dropped the name entirely. I have found so much confusion amongst the species I have examined, from

* Ann. Ent. Soc. Amer., vol. 6, No. 3, p. 269.

Europe, that I prefer to await the examination of the types of the older authors before changing the names of any of this group (with black halteres), because, as things are at present, there is but little hope of arriving at a correct interpretation of their descriptions, color being almost the only character used, and as this is very similar in all the species it is almost hopeless to attempt identifications.

Mallochiella glabra Fallen.

This species occurs in North America and may be separated from *halteralis* Coquillett by the following characters:

M. glabra.—Male: Black, including face and palpi, only the basal 3 joints of mid and hind tarsi yellowish at base; hind tibia very slightly dilated; last section of fifth vein recurved and shorter than the penultimate section of fourth; last section of fourth slightly less than four times as long as penultimate section. Length, 2 mm.

Female: Similar to the male except that the last section of fourth vein is barely more than three times as long as penultimate section. Length, 2.5 mm.

M. halteralis.—Male: Black, face below antennae, palpi and base of all tarsi yellow; hind tibia very much broadened; last section of fifth vein generally distinctly longer than penultimate section of fourth, last section of fourth vein generally five times as long as penultimate. Length, 1.5 mm.

Female: Colored as the male, and in other respects very similar except that the hind tibia is not conspicuously broadened, showing only a very slight thickening as in *glabra*. Length, 1.75 mm.

Halteralis seems to be widely distributed in North America. I have seen a large series of specimens in the collection of the Illinois State Laboratory of Natural History that were reared from refuse pig hair. The only specimens that I have seen from North America that are referable to *glabra* are several which I took at Frankford, Philadelphia, Pa., during September, 1913. These specimens are in the Academy of Natural Sciences, Philadelphia, with the exception of one which is now in the Illinois State Laboratory of Natural History.

AGROMYZA Fallen.

Owing to the addition of *A. quadrisetosa* in the Addenda to my paper on the genus *Agromyza*, and the description herewith of another species with black third antennal joint, the synoptic table should be altered as given here.

4. Frons black, only the frontal lunule yellow....*xanthophora* Schiner.
Frons yellow, only the ocellar spot black, and the orbits sometimes blackened posteriorly 5
5. Palpi and legs black.....*quadrisetosa* Malloch.
Palpi yellow, legs mostly yellow .....5a.
5a. Wings clear .....*longispinosa* Malloch.
Wings with a distinct infumation from end of vein 1 to apex of 2 which does not entirely cover the marginal cell...*fumicosta* n. sp.

Delete No. 5 in synoptic table in the paper in the *Annals* quoted and insert the above.

Agromyza fumicosta n. sp.

This species is very similar to *longispinosa,* differing only in being slightly smaller, in having the antennae slightly larger, the bristles on the mesonotum weaker; the wings more obtuse, the second vein undulated, the last section of fourth vein less than six times as long as the penultimate section (7-1 in *longispinosa*) and the costa with a distinct infuscation, which disappears before the lower margin of marginal cell is reached. In all other respects, coloration and chætotaxy, identical with *longispinosa.*

Type.—Swept from blue grass, May 3, 1894, Normal, Illinois. In collection of Illinois State Lab. Nat. Hist.

Agromyza felti new species.

Male: Pale yellow, shining, ocellar spot and back of head black; orbits slightly browned posteriorly; arista brown or black; other parts of head clear yellow. Mesonotum with a large black spot on disc which is most intense on the area covered by the discal mark in *melampyga* Loew; the quadrate area between the posterior lobes is filled with a less intense black color which extends almost to the scutellum and is centrally dentate; pleurae unspotted, or with a reddish triangular mark between fore and mid coxae, postnotum glossy black; scutellum with a small spot at base on each side. Abdomen with a brownish-black fascia on each segment, the posterior margin yellow; sixth segment elongated; hypopygium normal in shape, blackened laterally. Legs yellow, wings clear, veins distinct. Halteres yellow.

Frontal orbits distinct; four pairs of orbital bristles present, the lower pair rather weak, incurved; antennae as in *melampyga;* arista closely covered with pubescence, giving it a rather thickened appearance, its length not equal to that of frons; cheek about one-fifth as high as eyes; vibrissa weak. Four pairs of dorso-centrals on mesonotum, which decrease in strength towards anterior margin; discal hairs distinct. Abdomen as in *melampyga.* Legs of the normal shape; mid-tibia without any posterior bristles. Wings almost identical in

venation with those of *melampyga,* the penultimate section of fifth vein from one-half to three-fourths as long as last section. Length, 1.5 mm.

Locality: Hudson Falls, New York, May 27, 1910, reared from leaves of "walking leaf fern," *Camptosorus rhizophyllus.* Seven specimens. Named in honor of Dr. E. P. Felt, who transmitted the specimens.

Type and *paratypes* in New York State collection; *paratypes* in Illinois State Lab. Nat. Hist. collection.

Since submitting this paper for publication, the writer has reared this species from blotch mines in leaves of the fern *Asplenium pinnatifidum,* collected at Parker, Illinois, April 18, 1914.

This species is recorded as *A. melampyga* Loew, Bulletin 147, N. Y. State Museum, p. 67.

To include this species in the synoptic table in my paper previously mentioned it will be necessary to change couplet 6, second section, to read as follows:

Mesonotum with black stripe-like marks; or disc black, the center of disc in front of scutellum yellow owing to the abbreviation of the central portion of black mark; or at least a distinct yellow line on the posterior margin of disc in front of scutellum.8

8. Only the margins of discal mark black, the center portions reddish brown .....*melampyga* var. *marginalis* Malloch.
The whole of discal mark black 9

9. Markings on mesonotum dull gray black, not glossy, *borealis* Malloch.
Markings on mesonotum glossy black 10

10. The space between the lateral lobes of discal mark filled with black; posterior surface of mid tibiae without bristles..*felti* n. sp.
The space between the lateral lobes, posteriorly, clear yellow; posterior bristles present on mid tibiae.....10a

10a. Cheeks posteriorly about one-half the height of eye, arista almost bare .....*flavonigra* Coquillett.
Cheeks posteriorly much less than one-half the height of eye; arista pubescent .....*melampyga* Loew.

Agromyza pleuralis n. sp.

Female.—Black, subopaque. Head yellow, only ocellar spot, back of head, and small portion of orbits at upper extremity blackened. Mesonotum slightly grayish pruinose; pleurae yellow, a large spot be-

tween fore and midcoxae, a smaller one behind midcoxa, and postnotum black; abdomen brownish black, subopaque; hypopygium glossy. Legs, including coxae, entirely yellow. Wings clear, veins yellowish. Halteres white. Frontal bristles and thoracic hairs yellow, the other bristles brown.

Frons with four pairs of long orbital bristles; face slightly buccate; cheek one-third as high as eye (antennae in poor condition). Mesonotum with two pairs of dorso-centrals, the posterior pair very widely separated, the anterior pair weak; discal setulae numerous on the anterior half and rather long, becoming sparser on the posterior half. Legs slender, no bristles present. Wing with costa to fourth vein; veins 3 and 4 divergent; inner cross-vein at slightly before end of vein 1 and at middle of discal cell; last section of fourth vein six times as long as penultimate section; last section of fifth one and one-half times as long as penultimate section. Length, 1.75 mm.

Type.—Swept from catalpa, University grounds, Urbana, Illinois, June 21, 1898. (Marten). In collection Illinois State Lab. Nat. Hist.

This species will run down to *citreifrons* Malloch in my synoptic table in the paper previously referred to, but may be readily separated from that species and its allies by its possession of only two pairs of dorso-central bristles.

Agromyza youngi new species.

Male.—Black, shining. Squamae and halteres black. Wings clear, veins black.

Frons very slightly over one-third the width of head, frontal triangle shining, elongated, reaching over half-way to base of antennae and very distinct; orbits very narrow, rather thickly covered with hairs, which become much longer and stronger towards anterior margin, where one or two are setulose, the normal orbital bristles hardly distinguishable in type, all incurved; ocellar bristles widely separated at base and lying subparallel; frons in profile declivous; face short; the anterior margin of cheeks much produced, as in females of the *vibrissata* group; antennae small; arista bare, swollen at base, and very short, being slightly shorter than the width of frons at above antennae; cheeks narrow, about one-sixth the eye height; marginal bristles moderately strong; vibrissa indistinguishable.

Mesonotum with three pairs of dorso-centrals, the length of these slightly decreasing anteriorly, discal hairs very numerous, closely placed and not regularly arranged in rows; the pair of bristles between posterior dorso-centrals absent; pleurae and scutellum normal.

Abdomen short, broad at base, tapering very much to apex, its out-

line subtriangular; hypopygium very small; surface very distinctly hairy.

Legs normal, the posterior mid-tibial bristles absent.

Wings with costa to fourth vein; inner cross-vein at distinctly beyond end of first vein and at three-fourths from base of discal cell; outer cross-vein at about half its own length from inner; last section of fifth vein subequal with penultimate section; veins 3 and 4 very distinctly divergent. Length, 2.5 mm.

Locality: Albany, New York, April 28, 1913, reared from *Taraxacum densleonis*, dandelion. Received from Dr. E. P. Felt, New York State Entomologist.

Three males and one female reared by Mr. D. B. Young, after whom I take pleasure in naming the species.

Type and *allotype* in New York State collection. *Paratypes* in Illinois State Lab. Nat. Hist. collection.

Since submitting this paper for publication, the writer has taken a single specimen of this species at St. Joseph, Illinois. May 17, 1914.

This species will run down to *websteri* Malloch in my synoptic table, but may readily be separated by the much less strongly bristled orbits and the produced mouth-margin. The female of this species may be mistaken for one of the group which has the mouth-margin produced and the male with a conspicuous group of hairs on the vibrissal angle, but none of the species described in that group have more than two pairs of dorso-central bristles. One specimen of *youngi* has four pairs of dorso-centrals in the series before me, but this is abnormal, as in other respects it is identical with the type. The female has the orbits much less hairy, the orbital bristles much more distinct (3), and the mouth margin very much produced.

Agromyza dubitata Malloch.

In my paper in the *Annals*, I inadvertently left the name *californiensis* as that of the species with which I compared *dubitata*. This was due to the fact that I considered, at the time I wrote that description, that the specimen mentioned in the last paragraph dealing with *setosa* Loew was a distinct species and had given to it the name *californiensis*. I subsequently decided to allow this specimen to stand as *setosa*, but

unfortunately I did not change the wording under the name *dubitata*. The specimen with which I compared *dubitata* has only three distinct pairs of dorso-central bristles, hence my locating it in front of *dubitata*. In other respects the description of the latter may be compared with that of *setosa*.

I have to thank Dr. S. A. Forbes and Dr. E. P. Felt for permission to publish the descriptions of the new species included in this paper.

The Origin of Oligotropism (Hymen.).

By John H. Lovell, Waldoboro, Maine.

Certain statements recently made by Mr. Robertson in regard to the origin of oligotropism (Ent. News, 25: 67) call for brief consideration.

No evidence is offered to support his earlier assertion that *Epeolus* is a parasitic genus. As regards *Triepeolus donatus* the writer stated that he had taken it on the Compositae only in this locality.

Herman Müller, notwithstanding his great experience as a floroecologist, did not foresee the existence of the oligotropic habit. A discovery in retrospect often offers little difficulty. Thus Huxley writes: "My reflection when I first made myself master of the central idea of the 'Origin' was 'How extremely stupid not to have thought of that!'" (Life and Letters, 1: 183.)

It is manifestly futile for Robertson to quote statements of the writer, and merely express difference of opinion. This mode of argument is not common in scientific papers.

Robertson assumes the existence of competition. He says, "My view is that the bee fauna is all that the flora will support." This I do not admit, on the contrary I believe that it can be shown that only a part of the available flower food is gathered by bees. The commonness of an insect species does not depend alone on the quantity of food obtainable, e. g., occasionally the forest caterpillar (*Heterocampa guttivitta*), which feeds on the leaves of deciduous trees, appears in count-

less numbers, defoliating acres of the woodlands and apparently threatening the entire destruction of the hardwood forest; but it speedily disappears again and becomes so rare that its presence is unnoticed. The size of the bee fauna is likewise limited by other factors than the food supply.

It is desirable to consider a few specific instances where there is unquestionable evidence of a surplus of flower food. In Riverside County, California, the orange bloom secretes nectar so freely that it drips upon the clothing of the pruners, and at the end of a day's cultivating in the groves it is necessary to wash the horses and harnesses. Large quantities are lost each year for want of bees to collect it. Hundreds of acres of the sandy coastal plain of Georgia are covered with the bushes of the common gallberry (*Ilex glabra*). It remains in bloom for about a month, the secretion of nectar is constant and but little affected by the weather; but, according to J. J. Wilder, this sea of flowers is not frequently visited by insects. Immense quantities of fine honey are lost annually because there are no bees to gather it; furthermore it is not easy to overstock a gallberry region with the domestic bee, and in one instance 362 colonies did nearly as well as 100 previously. A conservative estimate by Iowa apiarists of great experience places the possible production of honey in that State for a single year at 60,000,000 pounds. The average moisture content of honey is 17.59 per cent., while that of nectar is not far from 75 per cent., so that the weight of the nectar would exceed that of the honey fourfold (Browne, C. A., "Chemical Analysis and Composition of American Honeys," U. S. Dept. Agr., Bur. Chem., Bull. 110, p. 45). This estimate, of course, does not take into consideration the nectar consumed by anthophilous insects other than the honey bee. If a region were already stocked to its fullest capacity with bees, it is clear that it would be impossible to establish a large apiary containing millions of bees, storing twenty or more tons of honey, consuming perhaps twice as much more, and requiring enormous quantities of pollen for brood-rearing. It will be remembered that the honey bee does not usually fly more than two miles from the apiary.

It would be easy to multiply examples in the case of buckwheat, basswood, tupelo, raspberry, heartsease and golden rod, and the extra-floral nectaries of cotton and *Cassia chamaechrista* in the Southern States. Certain plants, as *Bidens aristosa* in the lowlands of the Mississippi, fairly carpet large areas with their myriads of flowers. Fruit growers have learned from experience that the wild bees are wholly insufficient to gather the pollen and nectar of extensive plantations of fruit trees, berry bushes and cranberries; and effective pollination is secured only by the establishment of apiaries of the domestic bee. An immense quantity of pollen, which can be used by bees in emergencies, is produced by anemophilous plants, as the Amentaceae, elms, grasses, sedges, rushes, and a variety of coarse homely weeds. Occasionally honey bees by thousands do resort to anemophilous flowers for pollen; and much less frequently, because their necessities are less, the solitary bees. Many plants have probably remained wind-pollinated, while others formerly entomophilous have wholly or in part reverted to self-fertilization or anemophily in the absence of sufficient pollinators.

In none of his articles has Robertson ever presented satisfactory evidence of existing competition for flower food; and in reply to my earlier paper he now advances the hypothesis that oligotropism originated at some indefinite past time in the evolution of the long-tongued pygidial bees and Andrenidae, etc., from the competition of the former with the Bombidae and of the latter with the Halictidae. This highly imaginary supposition can not be supported by historical data, and would appear to be neither probable nor necessary. The polytropism of *Halictus* is the result of its peculiar economy. The impregnated females hibernate during the winter and appear the following spring; while the new generation flies during the latter half of the season. This economy has no special advantage for *Halictus* is greatly surpassed by *Andrena* in both species and individuals; while *Sphecodes* which has essentially the same economy as *Halictus* is represented by comparatively few species and individuals. It is an advantage for

a social bee to maintain its organization throughout the season; but for a solitary insect it is desirable that it mate and deposit its eggs as soon as possible. The longer the female flies before this happens the greater the probability is that she will be destroyed by some one of many causes. There are numerous other insects besides bees which have a short term of flight. A solitary bee, which like *Halictus* flies throughout the season, and of which the adult females pass the winter dormant is evidently exposed to more dangers than a species which passes the larger part of the year in an immature state in its burrows. Since many polytropic bees have either a short term of flight, or one which does not exceed 100 days, it is clear that a shorter term of flight is not necessarily correlated with oligotropism.

If severe competition did exist among the solitary bees for flower food, the oligotropic habit would not be desirable. It is not an advantage for a bee to restrict its visits to one kind of flower unless it is always certain to obtain the food supply it requires; otherwise it is clearly at a disadvantage as compared with the polytropic species. If severe competition is induced by artificial means, as by overstocking a locality, then the oligotropic bees will either tend to disappear or become polytropic. The small number of oligotropic bees reported from central Europe is noteworthy. If, however, a very common flower yields a surplus of food then a bee with a period of flight nearly coinciding with the period of inflorescence would save time and labor by restricting its visits to this species; and since bees instinctively learn from observation it would naturally be expected that the oligotropic habit would be formed. To some extent, at least, Robertson recognizes the correctness of this inference in the case of a part of the oligotropic visitors of the Compositae. He says, "It is not so surprising that some of these are exclusive when we consider that at their maximum the Compositae form 34 per cent. of the indigenous flowers." (Can. Ent., 42: 327.) Why, indeed, should the nest-building bees, which restrict their visits to the great tribes Astereae and Heliantheae do otherwise?

From the very beginning an oligotropic bee saves time and labor, and later may enhance this advantage by learning "to manipulate the pollen better than other bees."

In a previous paper I have reviewed the oligotropic species of Wisconsin *Andrena*, and have showed that there is no evidence that they have acquired this habit in competition for flower food. (Graenicher, S., "The Relations of the Andrenine Bees to the Entomophilous Flora of Milwaukee County," Trans. Wis. Ac. Nat. Sci., 15: 89-97.) Six vernal species, including the two earliest on the wing, are oligotropic to *Salix*, a very widely distributed genus producing a great abundance of pollen and nectar. The willow aments are also visited by all the vernal polytropic species, but their average time of flight is 33 per cent. longer than that of the oligotropic species. Of the eleven autumnal Andrenid species ten, or in view of the limited distribution of *A. parnassiae*, practically all are oligotropic to the Compositae. The single exception, *A. parnassiae*, occurs only at Whitefish Bay, Lake Michigan, where it is oligotropic to *Parnassia caroliniana*, a plant very common in that locality. Since the flower is widely distributed, while the bee is local, evidently the former has not determined the habitat of the latter. These figures certainly indicate that the adaptation of the vernal oligotropic species to the Salicaceae and of the autumnal species to the Compositae is determined by the character of the flowers. In a similar manner honey bees restrict their visits almost exclusively during the period of inflorescence to *Solidago*, which yields immense quantities of nectar and pollen; otherwise they would suffer great loss. If their flight were synchronous with the blooming period they would become oligotropic to the golden rods.

An examination of the characters and habits of the genus *Perdita* should throw some light on the origin of oligotropism. This large genus of bees is confined to North America and includes not far from 150 described species and varieties, most common in the arid regions of New Mexico. "Practically all are oligotropic," says Cockerell (Psyche, 18: 154.) Graeni-

cher also says, "All of the species so far as their habits are known are oligotropic" (Can. Ent., 46: 51.)

"The species are mostly very small." The length seldom exceeds 6 mm., and in some species is only 2½ to 3 mm. "They do not take long flights." So far as my observations go, they settle quickly and may be easily captured without a net. A part of the species are vernal; but the majority fly in late summer and autumn, and many visit the Compositae. A very large number have been found in only one State, approximately 74 in New Mexico (34 in the Mesilla Valley), 11 in Texas, 3 in Arizona, 14 in Colorado, 3 in Nevada, 2 in New Jersey, 1 in New England, and 6 in Mexico. About a dozen have been reported from more than one State, *P. octomaculata* of the East having the widest distribution. Oligotropism is as fully developed or, as the data available show, more pronounced, where there is only one or few species as where there are many. This habit cannot, therefore, be dependent on existing competition between the different species.

Many flowers are visited by more than one species of *Perdita; Salix* by 2; *Prosopis* by 2; *Mentzelia* by 1 at Santa Fe, and 2 others at Albuquerque; *Gutierrezia* by 6; *Solidago* by 4 in Colorado, by another in New Mexico, and in New England by a sixth species; while *Bigelovia wrightii*, which is "wonderfully attractive to many kinds of insects" furnished 12 species, etc. This behavior on the part of so many species of *Perdita* and other insects is very similar to that of higher forms of life when they gather at some feeding ground where there is a superabundance of food. The flowers visited by these bees occur in immense profusion and include the best honey plants of this country, as *Salix, Solidago, Cleome, Prosopis, Helianthus, Verbesina, Bidens aristosa* and *Monarda punctata*, a most valuable plant to beekeepers. It is noteworthy that we find these flowers also visited by oligotropic bees belonging to other genera.

The presence or absence of many species of *Perdita*, especially in the case of the Compositae, is determined by the length of the tongue. Cockerell states that the length of the

tongue appears to have increased or decreased according as the total size of the bee has increased or decreased, not to meet special requirements. Species of *Perdita* visit the flowers of both *Verbesina* and *Bigelovia,* but the species on the flowers of the former are much larger than those on the latter. The species of *Perdita* on *Gutierrezia* are still smaller than those on *Bigelovia.* The visitors of the Compositae according to Graenicher, are determined by tube-length more than by any other character of the flower ("Wisconsin Flowers and their Pollination," Bull. Wis. Nat. Hist. Soc., 7: 42.) Thus it is the tube-length of the flower, not competition, which is the factor limiting the visits of many species of *Perdita.* The facts related, as well as many others, are well in accord with the views of the writer. (On *Perdita,* see Cockerell, "The Bees of the Genus Perdita," Pr. Ac. Nat. Sci. Phil., 48: 25-107; "Notes on New Mexican Flowers and their Insect Visitors," Bot. Gaz., 24: 104-6; "A List of the Bees of the Genus *Perdita,*" Psyche, 18: 134-43. Also Graenicher, "Wisconsin Bees of the Genus *Perdita,*" Can. Ent., 46: 51-7.)

The female inquiline bees do not gather pollen and nectar for brood-rearing, but like the males of the nest-builders require only nectar for themselves—the males of the honey bee are even unable to feed themselves. Under these circumstances it should not be expected that they will exhibit the same constancy to flowers as the brood-rearing species. Nevertheless a number of the parasitic bees with a short term of flight visit wholly or largely the Compositae, and under Loew's definition would be called oligotropic species. This is of great interest since it is not claimed that *they* have acquired this habit as the result of competition.

According to the theory proposed by the writer certain bees have become oligotropic because of the direct advantage gained, combined with the fact that their flight was synchronous, or nearly so, with the period of inflorescence of the plant to which they restricted their visits. This theory offers an explanation of the rise of oligotropism by the observation of existing conditions. There may be and often are accessory fac-

tors, but they are of secondary importance. Robertson concedes all that is required, when he says, "The average flight is shorter and there are more of them with a short flight." A large number of oligotropic bees are of small size, as has been pointed out in the case of *Perdita.* I believe that I have sufficient evidence to establish my statement that *Halictoides novae-angliae,* a monotropic visitor here of the pickerel weed, has a weak flight. I have observed hundreds of these bees during a series of years, but I have never seen them fly far nor have I ever taken them on any other flower. But to quibble over minor details seems unnecessary in the absence of any evidence of severe competition among the solitary bees for flower food.

A Locustid Laying Eggs (Orth.)

On October 24, 1900, I observed at Annapolis, Maryland, a very common locustid ovipositing in a hollow weed. It first made an opening with its strong mandibles, slipping the ovipositor through it, then laying. An opening was made for each successive egg.—A. A. GIRAULT.

Comstock Memorial Library Fund.

Exercises in connection with the presentation of the Comstock Memorial Library Fund to Cornell University, on the occasion of the retirement of Professor John Henry Comstock at the close of forty-one years of active service, were held on Saturday, June 13, 1914, at three o'clock, in the Assembly Room, Roberts Hall, Cornell University. Addresses were made by Professors S. H. Gage, L. H. Bailey, and W. R. Lazenby, and by Dr. L. O. Howard, and a letter from President David Starr Jordan was read by Mrs. Ruby G. Smith. The memorial was presented by Prof. J. G. Needham, accepted by Prof. Comstock, presented by him to Cornell and accepted on behalf of the University by President J. G. Schurmann.

Proposed Monument to J. Henri Fabre.

A public subscription, under the patronage of M. R. Poincaré, President of the French Republic, has been instituted to purchase Harmas, the residence of J. Henri Fabre, to convert it into a museum and to erect a monument to him at Sérignan. The appeal, which has been widely distributed, says: "In respectful admiration for the world-wide work of the entomological *savant* your co-operation and subscription are solicited to aid in perpetuating the memory of the most modest and most genial of workers. The assistance of yourself and of all friends of science is counted on for a work whose sole end is the glorification of Science and of Letters." Subscriptions should be sent to M. Henry de la Paillonne, Mayor of Sérignan, Vaucluse, France. The honorary committee on this project includes, among others, Professors Perrier and Bouvier of the Museum of Natural History at Paris, Dr. G. V. Legros, biographer of Fabre, and M. Rostand, the famous dramatist.

ENTOMOLOGICAL NEWS.

PHILADELPHIA, PA., JULY, 1914.

What is a Species?

Linnaeus wrote, in section 157 of his *Philosophia Botanica* (1750):

> There are as many species as the Infinite Being produced diverse forms from the beginning; which forms, according to the fixed laws of generation, produced more, but always like themselves. Therefore, there are as many species as diverse forms or structures occur to-day.

Many species, as established by Linnaeus himself, were divided into several species, some of which were referred to one genus, some to another, by his successors, even in the first half of the nineteenth century. Prof. Poulton, in his presidential address to the Entomological Society of London in 1904, gave many illustrations of the divergences of opinion in the separation of species by the structural or form criterion.

In the latest number of the *American Naturalist* (June, 1914), Prof. J. H. Gerould treats of Species-building, largely with reference to his own breeding experiments with the Sulphur Butterflies. He calls the breeding-true criterion, the "always like themselves" of the Linnean dictum, "an unverified dogma." He thinks

> The erroneous idea that Linnean species are homogeneous, well-defined groups of equal importance has done much to retard progress in the experimental study of evolution. The limits of a species are often arbitrary, depending ultimately upon the temperament of the describer, and frequently based upon ignorance of the nearest allies of the individuals described, living in other parts of the world.
>
> The most definite criteria of species, viz.: that specific characters are constant and that hybrids of Linnean species are infertile *inter se*, are only approximately correct . . . .

Like all things else, our ideas of what constitutes a species change and will continue to change. As a consequence, the work of the taxonomist, the systematist, will never end as long as animals and plants exist. The time never will come when the status of every living thing will be definitively estab-

lished. Monographic revisions will pile on top of monographic revisions and the end will not be yet. The application of the tests of breeding to all supposed species will be a long and tedious task. Type and neotype will not suffice to determine what a species is, when the experimental method is in full possession of the field, and to-day's problems of nomenclature are as nothing to those that will then arise!

Notes and News.

ENTOMOLOGICAL GLEANINGS FROM ALL QUARTERS OF THE GLOBE.

More Nomenclatorial Notes on Trypetidae (Dipt.).

Since the publication of my "Nomenclatorial Notes on the Dipterous Family Trypetidae" in the NEWS for June, pages 275-279, I have seen a paper by Dr. Hendel in the Wiener Entomologische Zeitung, xxxiii, 73-98, 1914, entitled "Die Gattungen der Bohrfliegen," which is a synoptical table of the genera of the world, with their type-species. In this Dr. Hendel makes *Phorellia* Desv. (1830) equal to *Spilographa* Lw. (1862). This should be *Forellia* Desv. (1830) equal to *Spilographa* Lw. (1862) equal to *Phorellia* Rond. (1870), that is, if Desvoidy's species can be recognized. His (Hendel's) *Ditricha* Rond. (1856) should be *Dithryca* Rond. (1856) as originally proposed, and his *Hoplogaster* Rond. (1856) is evidently meant for *Oplochaeta* Rond. (1856). Both of these are recognized as part of *Carphotricha* Lw. (1862). *Ditricha* Rond. (1870) is a synonym of *Urellia* Desv. (1830). *Paracantha* Coq. (1899) is recognized as distinct from *Oplochaeta* Rond. by the presence of black facial spots. He errs in saying the third vein in *Paracantha* is bristly. It is entirely bare, which character may be used in separating it from *Oplochaeta* Rond. For *Euribia* Meig. (1800) he gives *arnica* Linn. as the type species, but as Coquillett in 1910 made *M. artemisiae* Fab. the type species, Hendel's designation is invalid. This is another instance showing the uncertainty of the status of Meigen's 1800 genera.—E. T. CRESSON, JR.

A Note on Argynnis laurenti Skinner (Lepid.).

In the ENT. NEWS, vol. xxiv, p. 450, 1913, Dr. Skinner describes under the above name an *Argynnis* from Silver Lake, Utah. We greatly fear that this so-called new species is identical with *kriemhild* Strecker, described and figured in the Ruffner Report, p. 1854 (1870), from Rio Florida, Colo. Strecker also mentions other specimens from

Utah and Arizona. We have a specimen from Utah which has been compared with Strecker's type and marked *exact;* this agrees extremely well with Dr. Skinner's description, especially with reference to the sinuate subterminal black line above and dot at base of secondaries, and the absence of silver markings below. We have other specimens from the vicinity of Provo, Utah; Beaver Canon, Idaho, and Yellowstone Park, Wyoming.

Kriemhild Stkr. is at present listed as a variety of *epithore* Bdv., but in our estimation it should stand as a distinct species with *laurenti* Skin. as a synonym.—Wm. Barnes, M.D., and J. McDunnough, Ph.D., Decatur, Ill.

Strecker's *kriemhild* was described from a female according to the description and was compared with *epithore* Bois. He mentions having examples from the Rio Florida, Colorado, from Arizona, and a female specimen mentioned on page 117 of his Catalogue as *bellona*, var. b, Utah. In his list of types (Lep. Rhop.-Het. suppl. 3) he mentions under *kriemhild* two males from the Rio Florida, Colorado (McCauley), one male, Utah; one female, Arizona.

I wrote to Mr. W. J. Gerhard, Curator, Department of Entomology, Field Museum, Chicago, in relation to the matter and his reply is as follows: "On examining the material under the name *Argynnis kriemhild* in the Strecker collection I found three specimens all marked original type and with the following data: One male, Utah (Johnson); one female, Rio Florida, Colorado (McCauley); one female, Arizona (Neumoegen). From this it is evident that the female from Utah, which he mentions in his Catalogue, either has been lost, or the sex of the specimen was originally wrongly determined. Although he apparently discovered his error when he published the list of types in his collection, nevertheless he makes a similar error when he calls his Colorado specimen a male."

I sent Mr. Gerhard a specimen of *laurenti* and he says: "I have compared your specimen carefully with the three types of *kriemhild* and have not been able to find the least difference among them. Your specimen, which is just a little fresher than ours, agrees with the types spot for spot, as well as in size and color. It looks very much as though your name *laurenti*, or rather species, must be regarded as a synonym of *kriemhild*."

Mr. W. H. Edwards in his Catalogue (1884) put *kriemhild* as a variety of *epithore* and it has so remained until the present time. Synonyms are unfortunate, but sometimes good follows the evil as we live and learn. This little study shows the necessity of a single type and I propose for the type of *kriemhild* Strecker the male specimen from Utah (Johnson).—Henry Skinner.

A Jubilee.

We extend to our fellow journal, *The Entomologist's Monthly Magazine,* our heartiest congratulations upon the fiftieth anniversary of its existence, June 1, 1914, and wish it continued success.

The *Magazine* was founded by E. C. Rye, H. T. Stainton, R. McLachlan, Dr. H. G. Knaggs and T. Blackburn. As one after another of these withdrew or deceased, their places were filled by others. McLachlan was the last survivor of the original board of editors and maintained his connection with the journal until his death on May 23, 1904.

The June, 1914, number contains an interesting sketch of the *Magazine's* history, with eight portraits of its founders and early editors.

Colias eurytheme Boisd. and its varieties (Lepid.).

The fixation of a type and the accurate illustration of types will make a considerable difference in our nomenclature and the standing of many species and varieties. *Eurytheme* has been placed as a variety of *chrysotheme* Esper and probably correctly so. Dr. Verity in his "Rhopalocera Palaearctica" has figured Boisduval's types (now in the Oberthür collection) of *eurytheme* Bd. and *amphidusa* Bd. *Keewaydin* Edw. is a synonym of *eurytheme*, and *ariadne* Edw. is a synonym of *amphidusa*. Strecker, in his Catalogue of American Macrolepidoptera, page 83, describes ab. ♀ *flava*, destitute of every trace of orange. Dr. Verity (p. 273, pl. 49, fig. 41) describes ♀ ab. *flavescens*. If *eurytheme* is considered a variety of *chrysotheme* this would make *flavescens* a synonym of *flava*.

Californiana Menetries is doubtless a synonym of *eurytheme* or *amphidusa*. *Eriphyle* Edw. is a yellow form of which *hageni* Edw. is a synonym. *Intermedia* Ckll. and *autumnalis* Ckll. come in somewhere between the other names. How many names we shall have is largely a matter of opinion. The relationship of so-called species of *Colias* is not well understood. Even *philodice* and *eurytheme* may be forms of one species. In the mountains of North Carolina, they can only be told apart by the color, being either yellow or orange respectively.—H. Skinner.

Suggestions for the Bibliographical Dictionary of Entomologists.

Apropos of the editorial in the May News: For Deppe localities see Ann. Mag. Nat. Hist., September, 1910, p. 284. At the New York Botanical Garden they have a system of large envelopes open at the top, in which they put all sorts of data relating to botanists. Each botanist has his envelope. Would not this be a good plan for entomologists? In this way much good material will accumulate for the future historian or biographer. The Philadelphia Academy would

be a good place to keep such a series of envelopes. Living entomologists might be asked to give lists of the places where they have collected. For most it would be no great trouble. I have in MS. a list of the new species described from my collections, with localities. Much information which does not require publishing might usefully be filed somewhere, where it could be got at when needed. The University of Colorado librarian has just published a complete list of writings of the U. of C. faculty from the beginning of the university to the middle of last year.—THEO. D. A. COCKERELL.

Notes on Lycaena xerces, antiacis and polyphemus. (Lep.).

Mr. J. C. Huguenin, of San Francisco, has lately sent me a nice series of freshly caught specimens of *Lycaena xerces* and *polyphemus,* and in addition there are a number of specimens in the collection of the Academy of Natural Sciences of Philadelphia, making in all forty specimens studied. In my opinion *xerces* and *polyphemus* represent but one species, *xerces* being the same as *polyphemus* with the black pupil of the white spots on the under sides of the wings absent. I have been unable to find any other difference.

Mr. Huguenin says the species has been abundant this year and on the second of April he took a large number of them. They were taken in the western district of the Twin Peaks, San Francisco, California. He remarks that they were caught in a very limited area, not more than two hundred square feet, and were flying in every direction among the big blue *Lupinus.* "*Antiacis* and *xerces* always fly together, and I am coming back to my old belief that they are only one species. For the last twenty-five years I always caught more *antiacis* than *xerces,* one-third *xerces* to two-thirds *antiacis,* but this year it is just the reverse, more *xerces* than *antiacis.*" Mr. F. X. Williams, ENT. NEWS, xix, 476, 1908, also expresses his belief that the two are identical.

I prefer the name *polyphemus* as the specimens agree perfectly with Mr. Oberthür's figure of the type of *polyphemus* in Lep. Comparee, Fasc. 9, pl. 239, f. 2072. The species would stand as *Lycaena xerces,* Bd. Ann. Ent. Soc. France (2), 10, 296, 1852, with *polyphemus,* Bd. Ann. Ent. Soc. Belg., p. 48, 1869, as a variety. If *antiacis* and *polyphemus* prove to be the same thing, *antiacis* would have priority and stand as a variety of *xerces.*

It is possible that the difference in temperature to which the chrysalids are individually exposed during the winter in the mountains may cause the presence or absence of the black dot (pupil). Heat and cold will produce this effect on chrysalids in confinement as proven by Standfuss in experiments on *Vanessa antiopa* and *io. Antiopa* loses its blue spots and *io* its eye-spot (ocellus).—HENRY SKINNER.

Observations on an Insectivorous Larva (Lepid.).

The 7th of October, 1911, I went for one day's collecting in the Sacramento Gulch near Fairfax, Marin Co., California. It was very warm in this little gulch, or valley, and was very dry. The only vegetation was tarweed (*Hemizonia luzulaefolia*), which was in full bloom and grew to a height of two feet. But few butterflies were collected—4 *Anosia plexippus*, 2 *Pyrameis carye*, 4 *Lycaena acmon*, 3 *Colias*, and 4 *Junonia* (very pale in color); 1 *Papilio philenor* (very much worn), 2 *Chrysophanus helloides*, 9 Skippers, a few *Coenonympha*, 5 *Vanessa californica* (very plentiful); 2 *Hemihyalea* moths (very much worn), and 2 *Catocola aholibah* (or near) fresh.

A Noctuid moth (*Heliothis dispaceus*—determined by Dr. Skinner), was exceedingly plentiful flying about the gulch. Twenty-five were collected but not one of them was perfect, all being worn from flying about through the sticky tarweed, I presume. One caterpillar of the moth was found eating the tarweed. The larva was about one and one-half inches in length, a beautiful little caterpillar of a peculiar shade of green, with few hairs. The larva was placed in a breeding cage with the following larvae: *Pontia* (*Pieris*) *rapae, Pyrameis carye, Papilio philenor, Hemihyalea edwardsi* (a noctuid), and a few little moth caterpillars. The larvae lived in perfect harmony for two or three days. When one of the *Pontia rapae* larva pupated, it was attacked in the first stage of the process by the larva of *Heliothis dispaceus* and eaten until not a vestige was left. The next day two *Pyrameis carye* and another *Pontia rapae* pupated. The *Pontia* chrysalid was immediately eaten but the other two pupae were not attacked.

I attributed the carnivorous appetite of the *Heliothis* larva to lack of the proper food plant. To test this possibility another experiment was performed. On the 12th of October the same year I went to the same gulch and found another caterpillar of the same species. This time I took a good supply of the food plant (tarweed). The plant was placed in the breeding cage together with seven or eight larvae and the *Heliothis* larva was then put in. The larva ate the tarweed with relish. Some of the caterpillars turned to pupae at the same time. The only one attacked was the *Pontia rapae* pupa. The chrysalid was attacked in the same way as the two previous ones, the *Heliothis* larva, beginning at the point of the thorax, then eating its way down the dorsal part to the end of the abdomen, and from there to the head, taking a path around the edge of the chrysalid and finally eating all the remaining parts of the chrysalid, it taking five hours to complete the repast.

The next day the carnivorous *Heliothis dispaceus* larva descended from the top of the cage and entered the ground, forming a cocoon one

inch under ground. The pupal period lasted ten days. Two of the moths were raised in this manner.

Conclusions: That the larvae of the *Heliothis dispaceus* will, without being forced by lack of their food plant (tarweed), eat the chrysalids of *Pontia rapae* and apparently no other.—J. C. HUGUENIN.

Some Corrections in Names of South American Tetriginae (Orth.).

In a paper on South American Tetriginae by Bruner,* a few corrections of names are made necessary through an oversight of literature.† Some of these names with their proposed changes are as follows: The genus *Lophotettix* Bruner, l. c., p. 137, is preoccupied by Hancock's name of the same spelling, previously applied to a genus of South American Tetriginae, recorded in the Transactions of the Entomological Society of London, p. 388, 1907. In place of Bruner's *Lophotettix* I suggest the name **Eutettigidea**, the type being *E. lineatus* Bruner. The type of the original *Lophotettix* Hanc., as already recorded, is *L. brevicristatus* Hancock.

Under the genus *Gladiotettix* Hanc., Bruner notes three species, namely: *turgida* Bol., *unicristata* Hanc., and *hancocki* Bruner. The two latter species belong to the genus *Lophotettix* Hanc., the species *Gladiotettix hancocki* Brun. being synonymous with the previously described *Lophotettix alticristatus* Hancock. The genus *Gladiotettix* Hanc. is restricted at present to one species, *G. turgidus* Bolivar.

The genus *Halmatettix* Hanc. is not mentioned by Bruner in this article, but he has plainly described it under the new name *Apteropedon* which necessarily falls as a synonym. Bruner's *Apteropedon apicale*, which forms his type, is also synonymous with the previously described *Halmatettix cristinotus* Hancock.

Under the genus *Sclerotettix*, l. c., p. 104, Bruner described five species. He has designated as the type his second species, *S. tibialis* Brun. The first species mentioned, *S. abbreviatus* Brun., appears from the description to be synonymous with *Crimisus lobatus* Hancock. It is also quite likely that he has confused the species *S. infuscatus* Brun. and *S. minor* Brun. with *Micronotus asperulus* Bol. and *Micronotus dubius* Hanc. respectively.

The genus *Prototettix* Bol., preoccupied, now *Liotettix* Bol., as given by Bruner, l. c., p. 122, is confined to Africa. It should be replaced by *Rytinatettix* Hanc. for the species he characterizes from South America.—J. L. HANCOCK, Chicago, Illinois.

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*Ann. Carnegie Mus., vii, 1910.

†It is owing to Bruner's admitted oversight of my paper in the Trans. Ent. Soc. Lond., pp. 387-426, 1907, that the present corrections are suggested.

Entomological Literature.

COMPILED BY E. T. CRESSON, JR., AND J. A. G. REHN.

Under the above head it is intended to note papers received at the Academy of Natural Sciences, of Philadelphia, pertaining to the Entomology of the Americas (North and South), including Arachnida and Myriopoda. Articles irrelevant to American entomology will not be noted; but contributions to anatomy, physiology and embryology of insects, however, whether relating to American or exotic species, will be recorded. The numbers in **Heavy-Faced Type** refer to the journals, as numbered in the following list, in which the papers are published, and are all dated the current year unless otherwise noted, always excepting those appearing in the January and February issues of the News, which are generally dated the year previous.

All continued papers, with few exceptions, are recorded only at their first installments.

The records of systematic papers are all grouped at the end of each Order of which they treat, and are separated from the rest by a dash.

For records of Economic Literature, see the Experiment Station Record, Office of Experiment Stations, Washington.

1—Proceedings, Academy of Natural Sciences of Philadelphia. **3**—The American Naturalist. **4**—The Canadian Entomologist. **5**—Psyche. **8**—The Entomologist's Monthly Magazine, London. **9**—The Entomologist, London. **10**—Nature, London. **11**—Annals and Magazine of Natural History, London. **22**—Zoologischer Anzeiger, Leipzig. **34**—Proceedings, Iowa Academy of Sciences, Des Moines. **36**—Transactions of the Entomological Society of London. **38**—Wiener Entomologische Zeitung. **40**—Societas Entomologica, Zurich. **50**—Proceedings of the U. S. National Museum. **60**—Anales, Museo Nacional de Buenos Aires. **65**—La Feuille des Jeunes Naturalistes, Paris. **79**—La Nature, Paris. **84**—Entomologische Rundschau. **86**—Annales, Societe Entomologique de France, Paris. **87**—Bulletin, Societe Entomologique de France, Paris. **89**—Zoologische Jahrbucher, Jena. **92**—Zeitschrift fur wissenschaftliche Insektenbiologie. **119**—Archiv fur Naturgeschichte, Berlin. **142**—Report, Michigan Academy of Sciences, Lansing. **153**—Bulletin, American Museum of Natural History, New York. **161**—Proceedings, Biological Society of Washington. **166**—Internationale Entomologische Zeitschrift, Guben. **176**—Archiv fur Entwicklungsmechanik der Organismen, Leipzig. **185**—Journal, Quekett Microscopical Club, London. **191**—Natur, Halbmonatschrift fur alle Naturfreunde. **193**—Entomologische Blatter, Cassel. **216**—Entomologische Zeitschrift, Frankfurt a. Main. **239**—Annales, Biologie Lacustre, Brussels. **243**—Yearbook, Department of Agriculture, Washington, D. C. **278**—Annales, Societe Zoologique Suisse et du Museum d'Histoire de Geneve, Revue Suisse de Zoologie. **324**—Journal of Animal Behavior, Cambridge. **353**—Arbeiten aus den Zoologischen Instituten der Universität Wien. **384**—Archivio Zoologico Italiano, Napoli. **394**—Parasitology, Cam-

bridge, England. **407**—Journal of Genetics, Cambridge, England. **447**—Journal of Agricultural Research, Washington. **461**—Bulletin de la Classe des Sciences, Academie Royal de Belgique, Brussels. **462**—The Butterfly Farmer, Truckee, Cal. **467**—Monthly Bulletin of the American Iron and Steel Institute, New York. **474**—Ontario Agricultural College, Toronto. **475**—Bulletin de la Societe Vaudoise des Sciences Naturelles. **476**—Fortschritte der Naturwissenschaftlichen Forschung.

GENERAL SUBJECT. Anon.—Der Entomologe, **216,** xxviii, 17-8. **Belon, R. P.**—Notice necrologique, **86,** lxxxiii, 136-40. **Berlese, A.**—Gli insetti loro organizzazione, sviluppo, abitudini e rapporti coll'uomo. Vol. II, Fasc. 7-8, 177-240. **Draper, B. M.**—A live box for the observations of insects and similar objects, **185,** xii, 313. **Escherich & Schwangart**—Zeitschrift fur angewandte entomologie, Band 1, Heft 1, 240 pp. (Berlin, P. Parey), 1914. **Gerould, J. H.**—Species-building by hybridization and mutation, **3,** xlviii, 321-38. **Goury & Guignon**—Insectes parasites des Droseracees, **65,** 1914, 81-3. **Harms, B.**—Insekten und Krankheiten, **191,** 1914, 356-8. **Heikertinger, F.**—Die phytokologie der tiere als selbstandiger wissenszweig, **38,** xxxiii, 99-112. **Imms, A. D.**—The scope and aims of applied entomology, **394,** vii, 69-87. **Krizenecky, J.**—Experimentelle und theoretische untersuchungen ueber die restitution der insektenflugel, **176,** xxxix, 131-62, 177-216. **Lonnberg, E.**—Was ist binare nomenklatur, **22,** xliv, 332-36. **Lovell, J. H.**—Conspicuous flowers rarely visited by insects, **324,** iv, 147-75. **Meigen, J. W.**—Ein gedenkblatt zu seinem 150jahrigen geburtstag. Von P. Speiser, **84,** xxxi, 52-3. **Meissner, O.**—Kurze bemerkungen ueber einige neuere naturwissenschaftliche theorien. V. Die Mendelschen regeln, **40,** xxix, 35. **Necholson, C.**—Respiratory movements of insects, **10,** 1914, 298. **Patton & Cragg**—A text book of medical entomology, 768 pp. (Christian Literature Society for India, London, Madras and Calcutta, 1913.) **Poche, F.**—Prufung der gutachten 1-51 der Internationalen nomenklaturkommission, **119,** 1914, A. 1, 1-41. **Scherdlin, P.**—Ueber die zucht nuetzlicher insekten in den U. S., **166,** viii, 24-6 (cont.). **Seitz, D.**—Entomologische streitfragen, **84,** xxxi, 55-6. **Thompson, F.**—Apparatus designed for setting small insects, **8,** 1914, 120-1. **Webster, F. M.**—Bringing applied entomology to the farmer, **243,** 1913, 75-92. **Wesenberg-Lund, C.**—Fortpflanzungsverhaltnisse: Paarung und eiablage der susswasserinsekten. Wohnungen und gehausebau der susswasserinsekten, **476,** viii, 161-286; ix, 55-132. **X**—Taxonomy and evolution, **3,** xlviii, 369-82.

ARACHNIDA, ETC. Cummins, H.—A sarcoptid mite in the cat, **142,** xv, 106. **Scheuring, L.**—Die augen der Arachnoideen, II,

89, xxxvii, Abt. f. Anat., 369-464. **Wenck, W. v.**—Entwicklungsgeschichtliche untersuchungen an tardigraden (Macrobiotus lacustris), **89,** xxxvii, Abt. f. Anat., 465-514.

Brolemann, H. W.—Etude sur les Spirobolides, **86,** lxxxiii, 1-38.

APTERA AND NEUROPTERA. Banks, N.—American Trichoptera—Notes and descriptions, **4,** 1914, 148-56. **Campion, H.**—Some dragonflies and their prey, **11,** xiii, 495-504. **Foerster, F.**—Beitrage zu den gattungen und arten der Libellen, **119,** 1914, A. 2, 59-83. **Longin-Navas, R. P.**—Neuropteres nouveaux de l'Amerique du Nord, **216,** xxviii, 18-20 (cont.).

HEMIPTERA. Caesar, L.—The San Jose and oyster shell scales, **474,** Bul. 219. **Ferriere, C.**—L'organe tracheo-parenchymateux de quelques Hemipteres aquatiques, **278,** xxii, 121-45. **Gadeau de Kerville, H.**—Anomalies antennaires de Pyrrhocoris apterus, **87,** 1914, 258-60. **Kershaw, J. C.**—The alimentary canal of a Cercopid, **5,** 1914, 65-72.

Bergroth, E.—Four new American Hemiptera, **5,** 1914, 73-5. **Cockerell & Robinson**—Descriptions and records of Coccidae, **153,** xxxiii, 327-35. **Neiva, A.**—Algunos datos sobre Hemipteros Hematofagos de la America del Sur, ... **60,** xxiv, 195-7.

LEPIDOPTERA. Bauer, E.—Vogelschutz, obstbau und gespinstmotte, **216,** xxviii, 47-8. **Bethune-Baker, G. T.**—The scales of the Ruralidae, with some observations on their colour problems, **36,** 1913, cxlii-cxciii. **Busck, A.**—New gen. and sps. of microlepidoptera from Panama, **50,** xlvii, 1-67. **Cavazza, F.**—Modificazioni riscontrate in esemplari di Bombyx mori derivanti . . . . **384,** vii, 313-30. **Engelhardt, V. v.**—Ueber die Hancocksche druse von Oecanthus pellucens, **22,** xliv, 219-27. **Gerould, J. H.**—(See under General Subject.) **Harrison & Doncaster**—On hybrids between moths of the geometrid subfamily Bistoninae . . . . **407,** iii, 229-48. **Poulton, E. B.**—Mimicry in No. American butterflies: a reply, **1,** 1914, 161-195. **Richter, V. K. J.**—Ueber lepidopterofaunistische publikationen, **166,** viii, 32-3. **Rowley, R. R.**—Hunting chrysalids and cocoons, **462,** i, 161-2. **Semichon, L.**—Secretion provoquee d'un deuxieme cocon. Experiences sur Metzneria lapella, **87,** 1914, 209-10. **Slevogt, B.**—Ueber den wert wissenschaftlicher, namentlich lepidopterologischer hypothesen, **92,** x, 145-7. **Verlaine, L.**—La spermatogenese ches les lepidopteres, **461,** 1913, 701-57.

Cockle, J. W.—Bombycia improvisa and tearlii, **4,** 1914, 184. **Dyar, H. G.**—Doctors Barnes and McDunnough on Florida L., **4,** 1914, 179-80. The noctuid moths of the genera Palindia and Dyomyx. Report on the L. of the Smithsonian Biological Survey of the Panama Canal Zone, **50,** xlvii, 95-116, 139-350. **Forbes, W. T. M.**—The N. A. families of L., **5,** 1914, 53-65. **Meyrick, E.**—Lepidop-

terorum catalogus. Pars 19: Hyponomeutidae, Pleutellidae, Amphitheridae, 64 pp. **Walsingham, L.**—Biologia centrali-americana. Heterocera IV, 225-280.

DIPTERA. Darlington, T.—The menace of mosquitoes and what to do about it, **467,** ii, 62-68. **Merle, R.**—Les varrons des bovides, **79,** 1914, 380-2. **Severin & Severin**—Behavior of the mediterranean fruit fly (Ceratitis capitata) towards kerosene, **324.** iv, 223-27. **Wahl, B.**—Ueber die kopfbildung cyclorhapher dipteren-larven und die postembryonale entwicklung des fliegenkopfes, **353,** xx, heft 2, 35-114. **Whiting, P. W.**—Heredity of bristles in the common greenbottle fly, Lucilia sericata. A study of factors governing distribution, **3,** xlviii, 339-55.

Brues, C. T.—The phorid genus Platyphora in America, **5,** 1914, 76-9. **Cosens, A.**—The gall produced by Cystiphora canadensis, **4,** 1914, 180. **Enderlein, G.**—Zur kenntnis tropischer Asiliden, **22,** xliv, 241-63. **Hendel, F.**—Die gattungen der bohrfliegen, **38,** xxxiii, 73-98. **Kertesz, K.**—Some remarks on American Lauxaniidae, **5,** 1914, 82. **Knab, F.**—Simuliidae of Peru, **161,** xxvii, 81-6. **Philips, W. J.**—Corn-leaf blotch miner (Agromyza parvicornis), **447,** ii, 15-31. **Villeneuve, J.**—Quelques reflexions au sujet de la tribu des Calliphorinae, **87,** 1914, 256-8.

COLEOPTERA. Brocher, F.—Observations biologiques sur les Dyticides, **239,** vi, 305-13. **Gorka, A. v.**—Experimentelle und morphologische beitrage zur physiologie der malpighischen gefasse der kafer, **89,** xxxiv, Abt. f. Allgem. Z., 233-338. **Hass, W.**—Die asymmetrie der flugelrudimente bei Carabus auratus, **22,** xliv, 292-97. **Prell, H.**—Mannliche sexualcharaktere als monstrositat bei einem weiblichen kaefer, **193,** 1914, 140-42. **Webster, R. L.**—Life history notes on the plum curculio in Iowa (Conotrachelus nenuphar), **34,** xx, 313-15.

Blair, K. G.—On the Fabrician types of Tenebrionidae in the Banks collection, **11,** xiii, 482-90. **Jeannel, R.**—Coleopterorum catalogus, Pars 60: Silphidae: Bathysciinae, 62 pp. **Wichmann, H.**—Zur kenntnis der Ipiden—II, **193,** 1914, 136-9.

HYMENOPTERA. Boulange, H.—L'appareil copulatieur de Tenthredella temula, **87,** 1914, 260-66. **Von Engelhardt, V.**—Ueber den bau der gynandromorphen bienen (Apis mellifica), **92,** xi, 161-7 (cont.). **Ferton, C.**—Notes detachees sur l'instinct des H. melliferes et Ravisseurs, **86,** lxxxiii, 81-119. **Friese & Wagner**—Zoologische studien an hummeln, **89,** xxxvii, Abt. f. Syst., 172-98. **Hudson, G. V.**—Evidence of memory and reasoning in a Pompilid, **8,** 1914, 121. **Wheeler, W. M.**—Note on the habits of Liomyrmex, **5,** 1914, 75-6.

Brethes, J.—H. de la America meridional, **60,** xxiv, 35-165. **Cockerell, T. D. A.**—Names applied to the N. A. bees of the genera Lithurgus, Anthidium and allies, **50,** xlvii, 87-94. **Crawford, J. C.**—H., superfamilies Apoidea and Chalcidoidea, of the Yale-Dominican expedition of 1913, **50,** xlvii, 131-34. **Crosby & Leonard**—An egg parasite of the tarnished plant bug (Lygus pratensis), **4,** 1914, 181-2. **Forel, A.**—Fourmis d'Argentine, du Bresil, du Guatemala & de Cuba, **475,** xlix, 203-50. **Gaige, F. M.**—Description of a n. subsp. of Pogonomyrmex occidentalis from Nevada, **161,** xxvii, 93-6. **Jorgensen, P.**—Las Tenthredinoidea de la Republica Argentina, **60,** xxiv, 247-88. **Morley, C.**—A monograph of the genus Joppidium (Ichneumonidae), **9,** 1914, 137-41. **Rohwer, S. A.**—Descriptions of two n. gen. of parasitic H., **5,** 1914, 79-81.

A Text Book of Medical Entomology. By Walter Scott Patton, M.B. (Edin.), I. M. S., King. Inst. of Preventive Medicine, Guindy, Madras, and Francis William Cragg, M.D. (Edin.), I. M. S., Central Research Inst., Kasauli, Punjab. Christian Literature Society for India. London, Madras, Calcutta, 1913. (Price, one pound one shilling.)

This is a large octavo volume of 764 pages, 89 plates and some text-figures. Some idea of this extensive work may be obtained from a brief mention of the contents. Anatomy and physiology, general structure, internal structure (pp. 1-93). Diptera, Orthorrapha, Nematocera, Brachycera, Cyclorrapha, Pupipara (pp. 94-404). Siphonaptera (pp. 405-434). Rhynchota (pp. 435-478). Anoplura (pp. 479-527). Acarina (pp. 528-681). Pentastomida: Linguatulidae (pp. 682-698). Eucopepoda: Cyclops (pp. 699-705). Laboratory technic (pp. 706-711). Relations of Arthropoda to their Parasites (pp. 712-726).

The authors mention the difficulties the medical and veterinary officers have in the tropics to obtain the necessary literature, which is scattered in many publications, thus making such a work essential. "With the advent of journals specially devoted to the subject the current literature has now become available and it is possible to keep one's knowledge up to date." The present volume is to give a working foundation of what has preceded in the older and more scattered literature. The rapid increase of the literature of medical entomology and the recognition of its practical importance to humanity is well illustrated by this great contribution to the subject. It contains many original illustrations, especially relating to the anatomy of insects that transmit disease. Such a work will be of immense value to the medical man in the tropics or in any place not accessible to good special libraries, and even where libraries are available it is a great aid to have the essentials culled for one, as it saves valuable time.

The subject has developed in a few years into a special field of work and makes one realize that it is indeed the era of insects and they must be studied from every viewpoint. The systematist, the economic student in relation to plant life and other commodities, have struggled with the vast hordes of insects and now the medical entomologist comes in for a large share of the general burden. A few years ago our wildest dreams would not have contemplated a work of the magnitude and character of the one here noticed.—Henry Skinner. (*Advertisement.*)

Doings of Societies.

FELDMAN COLLECTING SOCIAL.

Meeting of March 18, 1914, at the home of H. W. Wenzel, 5614 Stewart Street, Philadelphia. Eleven members were present. President H. A. Wenzel in the chair.

Mr. Daecke said he had sent his *Lachnosterna* to Mr. John J. Davis, a specialist in that group, for verification and found he had some wrongly determined. The specimen in the New Jersey list known as *parvidens* LeC. from Manumuskin, June 23, 1902, should be placed under *aemula* Horn, making now two specimens from New Jersey, the other being DaCosta, June 4, 1905, beaten from a pine tree. The *rugosa* Melsh. record from Merchantville, March 15, should be placed with *luctuosa* Horn, making also two records of this species, the other being Buena Vista.

Mr. Laurent said that on July 5, 1913, previous to a heavy thunder shower, it became so dark that one could not see to read. Looking from the window he saw numerous bright red lights of some species of Lampyridae. The beetle was plentiful enough, but not having a net he succeeded in capturing only one specimen, which proved to be *Photinus pyralis* Linn.

Mr. Kaeber said he had gotten some small twigs of wild cherry at Lester, Delaware County, Pennsylvania, in January, containing many pupae, and upon cutting open one of the stems on February 14th had found an imago of *Dysphaga tenuipes* Hald. (Col.).

Adjourned to the annex.

Meeting of April 15, 1914, at the same residence. Nine members were present. President H. A. Wenzel in the chair.

Mr. Kaeber said since the last meeting he had reared more specimens of *Dysphaga tenuipes* Hald. (Col.), and that the first two had brown elytra with dark spot and the next two reddish black elytra and black thorax.

Mr. Wenzel exhibited wood with larvae of *Prionus* (?) and also burrows of a species of bee. Recorded two specimens of *Chrysobothris convexa* Fall from Chisos Mts., Texas, July 19, one collected by J. W. Green and the other by H. A. Wenzel. The type locality for this beetle is Alamogordo, New Mexico.

Two newspaper articles were read, one on "A Seven-legged Curacoa Bug" and one on *Amblychila cylindriformis* Say.

Mr. Geo. M. Greene remarked on his card catalog of North American Coleoptera and pointed out some "oddities" in a recent paper.

Adjourned to the annex.

GEO. M. GREENE, *Secretary.*

OBITUARY.

DR. CARL CHUN, professor of zoology in the University of Leipzig, died April 11, 1914. Although chiefly distinguished, in recent years, for his oceanographical work as scientific leader of the German Deep Sea Expedition on the steamship *Valdivia*, he published in 1875 an elaborate paper on the structure, development and physiological significance of the rectal glands in insects. He was sixty-two years old.

MR. FRANK E. MOESER, a collector of Lepidoptera and a keen observer of their life histories, died at his home, 239 Guilford Street, Buffalo, New York, on May 15th, being forty-five years of age. His work, among the local Noctuidae especially, proved of interest, in that material brought to notice by Grote, when the latter was with the Buffalo Society of Natural Sciences, was again collected by him. He is survived by a wife, daughter and son.—H. B.

MR. AND MRS. H. H. LYMAN perished in the terrible disaster of May 29, 1914, when the Canadian Pacific steamship,

Empress of Ireland, foundered in the St. Lawrence River off Father Point, Quebec. Those of us whose latest personal association with both of them was at the Atlanta meeting of the Entomological Society of America, last December, feel the suddenness of their removal with especial keenness, remembering the eagerness with which Mrs. Lyman was looking forward to the visit to England so hopelessly prevented at its outset. To our Canadian colleagues we tender our hearty sympathy.

Henry Herbert Lyman was born at Montreal, Canada, December 21, 1854, and took the B.A. and M.A. degrees at McGill University in 1876 and 1880, respectively. He engaged in the drug business, eventually becoming senior partner of the firm of Lyman, Sons & Company and also president of The Lyman Brothers & Company, Limited, of Toronto.

Dr. C. J. S. Bethune wrote of him in the Report of the Entomological Society of Ontario for 1899 (p. 123):

When less than eight years old he began to take an interest in insects and to observe their ways, and when only twelve he started to form a collection, the precursor of what is now one of the finest collections of Lepidoptera in Canada. His first printed observation on insects appeared in the sixth volume of the Canadian Entomologist (1874) and showed that even in those early days he was engaged in the rearing of butterflies and moths, a work to which he has largely devoted himself ever since.

The scientific societies with which he was connected include the Entomological Society of Ontario (vice-president 1895-7, president 1897-9), and its Montreal Branch, the Entomological Society of America (fellow), the New York Entomological Society, Cambridge Entomological Club, Natural History Society of Montreal, the International Congresses of Entomology, and the American and British Associations for the Advancement of Science.

Mr. Arthur Gibson, Chief Assistant Entomologist of the Department of Agriculture of the Dominion of Canada, writes:

His death is a great loss to our Society, particularly to the entomological branch. He had been looking forward to continuing his entomological work, as in alterations recently made to his house [74 McTavish Street, Montreal] he had arranged for an entomological studio, greenhouse, etc., for studying life-histories.

H. S.

EXCHANGES.

Not Exceeding Three Lines Free to Subscribers.

☞ These notices are continued as long as our limited space will allow; the new ones are added at the end of the column, and only when necessary those at the top (being longest in) are discontinued

Wanted—Insect Life, Vol. V, No. 5, and Bibliography of American Economic Entomology, No. 4. Write offer.—Geo. M. Greene, 1303 N. 54th St., Philadelphia, Pa.

Miss Sarah Maul, 14 Channing St., N. W., Washington, D. C. Collector and breeder of Lepidoptera. Purchasers wanted.

The undersigned will greatly appreciate receiving records of New Jersey species not listed in Smith's Insects of New Jersey.—Harry B. Weiss, 272 Hale St., New Brunswick, N. J.

N. A. Coleoptera for Exchange—My list of over one thousand species of N. A. Coleoptera is now ready. If you wish to exchange, answer by sending me your list of what you have to offer.—Philip Laurent, 31 East Mt. Airy Ave., Philadelphia, Pa.

I offer for exchange a few perfect, bred specimens of *Vanessa gonerilla* in papers. Desire many common North American species of Lepidoptera, both Macro and Micro.—Fred Marloff, Box 104 Oak Station P.O., Allegheny Co., Pa.

Specialists—I will collect for cash any order of insects during the coming season in this vicinity. Flat rates given.—Harry Johnson, South Meriden, Conn.

For Exchange—Volumes VII to XII Entomological News for other entomological publications or for Lepidoptera.—Alex. Kwiat, 2055 Pensacola Ave., Chicago, Ill.

Wanted, for my own library—Papers by LeConte, Horn, Harris, Randall and Melsheimer in Jour. Bost. Soc. Nat. Hist., 1835, 1845; Jour. Acad. Nat. Sci. Phila., 1852; Proc. Acad. Nat. Sci. Phila., 1844, 1856, 1868; Trans. Amer. Ent. Soc., Vols. 3, 4, 5, 7; Lists of Coleoptera, J. D. Putnam, 1876; Schiödte, Metamorphoses, Parts 2, 6; Casey, Contributions to Coleopterology, Part 2, 1884.—Address John D. Sherman, Jr., 403 Seneca Ave., Mount Vernon, N. Y.

To complete sets in my library I need No. 1 of Vol. XXX, Canadian Entomologist, Riley's 9th Missouri Report and No. 18 of Henry Edwards' Pacific Coast Lepidoptera. I will give cash or liberal exchange in California insects.—H. H. Newcomb, Venice, California.

Heteroptera—I am engaged on the study of this group and desire material from all regions, especially New England. Will exchange in this and other orders. Correspondence desired.—H. M. Parshley, Bussey Institution, Forest Hills, Mass.

Wanted—to purchase for cash the following numbers of the Experiment Station Record, Vol. I, No. 2; Vol. II, Nos. 2 and 9; Vol. III, Nos. 4 and 10.—J. F. Abbott, Washington University, St. Louis, Mo.

Wanted—Larvae or ova of *cecropia*, *polyphemus* and *Saturnia galbina*.—O. C. Poling, Phoenix, Arizona.

Photographs of Entomologists Desired.

The Entomological Section of the Philadelphia Academy of Natural Sciences desires for its entomological album the photograph of every entomological student. The collection contains over 300 at this date. A list was published in the NEWS 1902, pages 45-47, of those in the album at that time. We hope that those who can do so will write their names and date of birth and the date when the photograph was taken on the back of each photo, along with any other information concerning themselves they may wish to impart.

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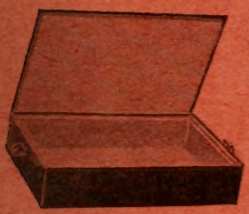

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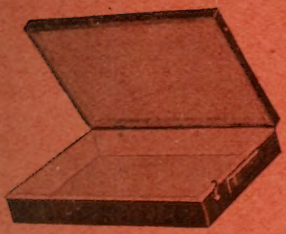

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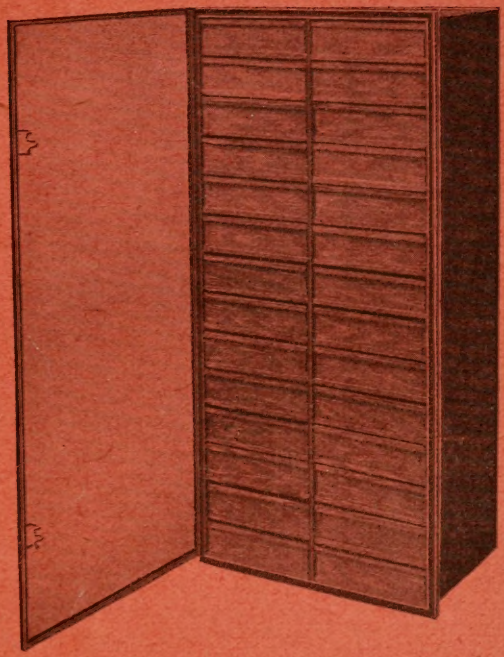

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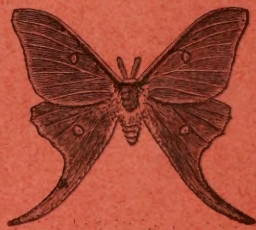

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